

MODERN PLASTICS

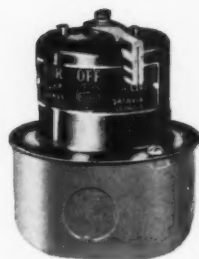


JUNE 1954

Achievement in Plastics

Finds its Culmination in
THE 6TH NATIONAL PLASTICS EXPOSITION

Good value...sold well



Better value...sells better

Be ready for tomorrow...with better value!

Reasoning that the lid on volume is off when you offer better value, the Furnas Electric Company of Batavia, Ill., took a course that has meant higher sales and profits in many kinds of business: they redesigned to make maximum use of phenolic plastics.

Fewer parts are necessary in the new switches. Assembly is simpler. Basic molded units are used in several models. Along with better performance and improved appearance, customers got a 20% cost saving...and sales boomed!

Durez has specialized in these most versatile of the engineering plastics for 33 years and continues to extend their industrial importance by developing new molding compounds and resins.

Why not find out where they fit your objectives best — in simplifying production — lowering costs — improving product service — and appearance? Write...and ask for our helpful monthly "Plastics News."

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Your 18-piece, appealingly packaged Serv-Rite* Corn Service Setting is ready—so draw up a chair and join the party! This treat is on the Royal-Pacific Co.—and it is “just as Corny as Kansas in August” . . . Enjoyably so!

As molded of CATALIN STYRENE, the set provides prong-tipped, cob-simulated skewers to *pin back the ears* and avoid *butter fingers*. The natural-colored cover of the master butter service, too, is designed as an “ear” and is based on a green-toned “husk.” Individual husks cleanly take over at this point and evenly roll-in the melting butter par . . . When

you then spice to taste with the aid of the miniature salt and pepper “ears,” you are ready to *harvest* your corn!

For this, as for so many molded plastic applications, the choice of CATALIN STYRENE is one of good judgment—and also a contribution to *good taste*.

*Molded by Royal-Pacific Co. 7812 Main Ave., Los Angeles 1, Calif.

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CATALIN

In addition to Styrene Molding Compounds, Catalin chemical products include a wide range of Urea, Phenolic, Cresylic, Resorcinol, Melamine and Styrene Resin formulations.

MODERN PLASTICS*

June 1954 • Vol. 31, No. 10

CONTENTS

GENERAL SECTION

The Record of Silent Successes (Editorial) 5

Achievement in Plastics 121

Big Business in Brushes 122

Pioneering Pays Off 124

Mother Never Had it So Good 126

"New Look" for Windows 130

What Makes Rugged Rainwear 132

Light in the Modern Manner 134

It Clings to Itself 137

Vinyl on the Inside 138

New Switch on Spouts 140

Refrigerator Revolution 142

Vinyl Takes the Floor 146

A Challenge to Junior 148

Built to Take a Beating 151

Phenolic + Wood = Quality 152

Table Cover Comeback 157

The Smaller the Better 158

Packaged Pools 160

New Day in Distribution 161

Goodbye Redecoration 164

Success Story: Melamine Dinnerware 166

Best Seat in the House 168

Glamorized Clothes Closets 170

Records Swing to Styrene 172

Biggest Improvement in Pans 175

How to Sell More Blades 176

Fresh, Clean, and Handy 178

Bigger Handles — Better Irons 180

It Had to be Sold! 181

Guide to 6th National Plastics Exposition
facing page 184

Canadian S.P.I. 263

Pacific Coast S.P.I. 264

PLASTICS ENGINEERING

Solving Big Mold Problems 189
by Islyn Thomas

A New Look at Extrusion 198
by Herbert O. Corbett

TECHNICAL SECTION

Properties of Plastics Films 203
by Murray C. Slone and Frank W. Reinhart

DEPARTMENTS

Plastics Digest 230

U. S. Plastics Patents 236

New Machinery and Equipment 242

Books and Booklets 250

Production of Plastics Materials 260

Manufacturers' Literature 371

Classified Advertisements 402

Index of Advertisers 408

THE PLASTISCOPE 382

News of the Industry; Predictions and Interpretations; Company News; Personal Meetings

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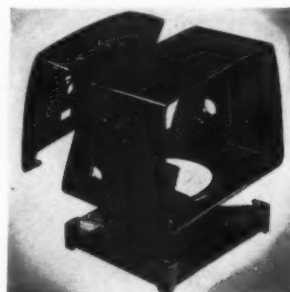
The result is a product with the porcelainlike finish of molded polystyrene. Campco sheet is easily embossed or deep-drawn under heat. It can be printed, painted, laminated. Available in full range of translucent or opaque colors. Widths from 20" to 58". Thicknesses from .005" to .125", any desired length. See it formed on the spot with lowest cost tooling—Booth 128. National Plastics Exposition.



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June • 1954

EDITORIAL

The Record of Silent Successes

At the Sixth National Plastics Exposition, to be held in Cleveland this month, there will be pointed up a serene fact upon which this industry has built in three decades a volume of resin use amounting to nearly three billion pounds annually.

The fact is this: people are most violently voluble in complaint about misapplications of plastics while accepting good applications to the point of forgetting that they are plastics.

Which is a wonderful thing and unique to this industry. Probably no other industry is as rapidly and effectively policed by the public!

In the past quarter century, over one hundred million electric irons with phenolic handles have been sold with satisfaction to the users who never think of the handles of the irons as plastics. Upwards of fifty million refrigerators have been sold embodying at least half a billion pounds of plastics—and the owners of these refrigerators give little thought to the plastic components. A garment bag made only eight years ago cost more than ten dollars, while a much better product today can be purchased for three dollars—and the public, bless it, doesn't even think about it, but buys more garment bags. In five years squeeze bottles have changed from a merchandising novelty into utilitarian dispensing devices for thousands of consumer and industrial products—and the public is pleased to use them without comment. Thanks to plastics, a portable radio cabinet which a few years ago weighed many pounds now weighs not more than one pound, and is a better product in every way—and the listener cares not at all that the case is plastic. The break-resistant phonograph record, mass produced at a fraction of the price of former records, is accepted as a record and not as a plastic product. Good plastics housewares have received constant use for many years in over forty million homes. Plastics toys by the billions have been making two generations of children happy with safety—and only when a "lemon" application turns up does the public know and blame it on plastics.

With this pre-show number of *MODERN PLASTICS*, we take occasion to re-emphasize the utilitarian value of plastics products and products with plastics components—products which have been made of plastics for several years by manufacturers who have constantly emphasized proper application of materials, good engineering, sound design, and quality.

Many of the really important achievements in plastics, the best and largest volume uses, have grown stable with no fanfare and little obvious recognition. Many will so develop in the future.

For every noisome misapplication—largely occasioned by the experiment necessary to open up new fields—there are thousands of rather silent successes, applications which consume billions of pounds of plastics.

This issue is dedicated to such sound applications, which have spurred the tremendous growth of the plastics industry.

the leaders in the plastic industry
come to us for their grinder needs



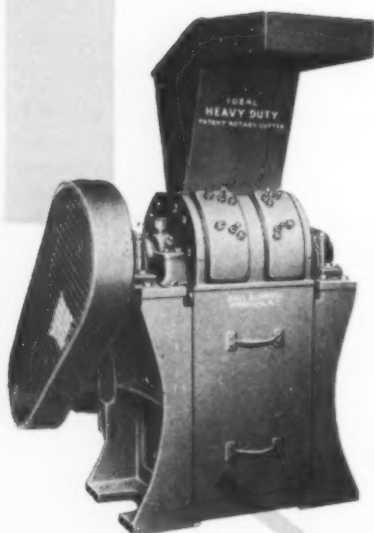
leaders in granulating machinery for over 50 years

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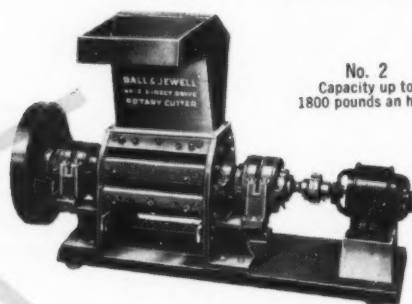
From drawing board to finished product, every B & J granulator is designed and built to provide dependable operation, maximum capacity, minimum maintenance, and, above all, years and years of continuous service . . . all in as compact a unit as possible. And, where B & J engineering leaves off, B & J technical service starts . . . helping you select the proper machine to meet your requirements — for the capacity you need and the material you grind.

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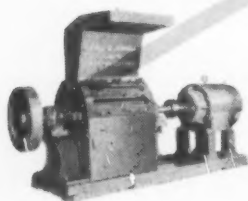


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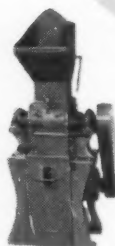
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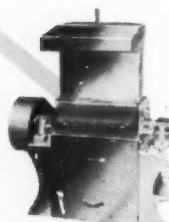
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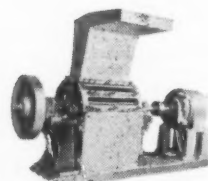
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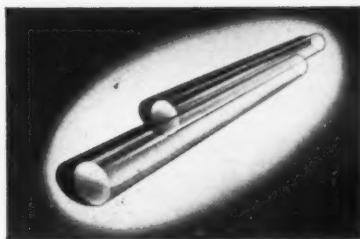
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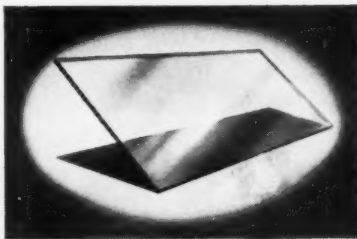
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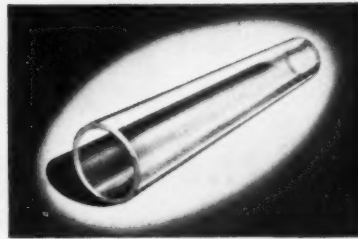
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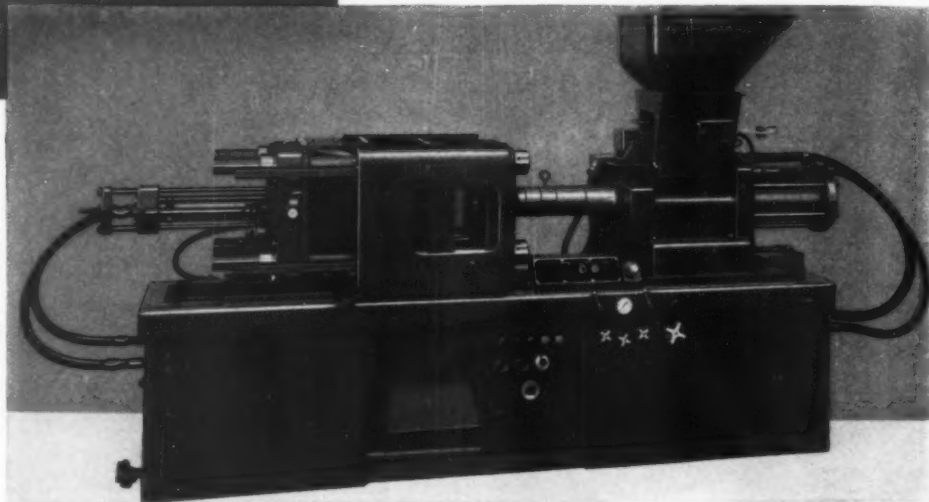
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with new "Reed-Weigh"
Hopper Feed Unit



and the brand-new 300T-12/16 oz. "REED"

The high-speed Reed-Prentice 175T-4/6 oz. injection machine — already proving itself in the field — will be molding plastic parts on full automatic cycles at the National Plastics Exposition. And shown for the first time will be the all-new 300T-12/16 oz. "Reed" which combines speed and ruggedness with extra molding capacity.

Both machines will be molding uniform parts accurately weighed by "Reed-Weigh" — the precision weigh feed hopper unit designed exclusively for Reed-Prentice injection machines.

Be sure to see these new "Reeds" at the show.
We'll be looking for you!

SPECIFICATIONS	4 oz.	8 oz.	12 oz.	16 oz.	20 oz.	32 oz.	48 oz.
Mold clamping pressure, tons	175	275	300	400	450	600	600
Mold clamping stroke	5-8"	10 1/4"	7 1/2-12 1/2"	8-14"	16"	24"	24"
Platen size (WxH)	22x24 1/4"	21"x25"	29x32 1/2"	38x36"	45x40"	54x45"	54x45"
Mold size, max.	13 1/2 x 24 1/4"	21 x 14 1/4"	29 x 20 1/2"	38 x 23 1/2"	45 x 25 1/2"	54 x 26 1/2"	54 x 26 1/2"
Diameter of tie bars	3"	3 1/4"	4"	4 1/2"	5"	6"	6"
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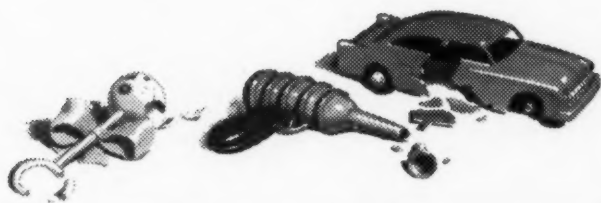
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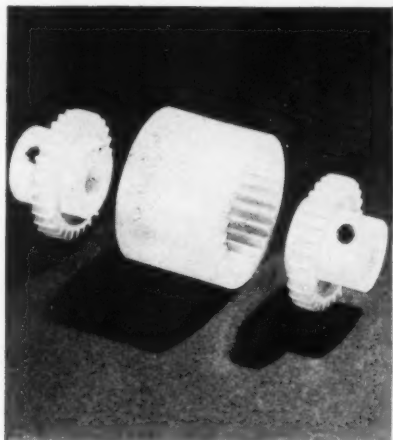
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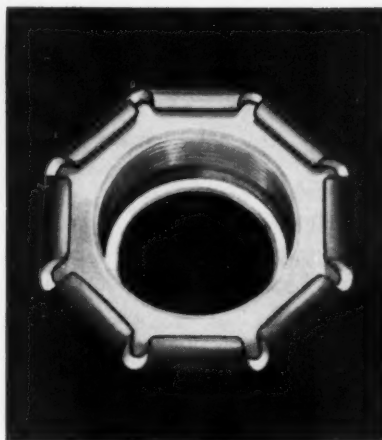
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A NEW TRADE-MARK ...ZYTEL



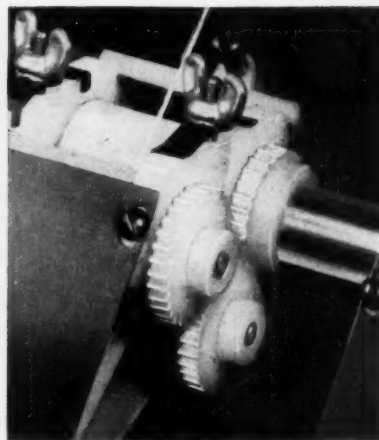
Strength, resiliency

"Zytel" is strong, yet resilient. Tough parts of "Zytel" like this coupling are produced in intricate shapes by speedy, economical injection molding.



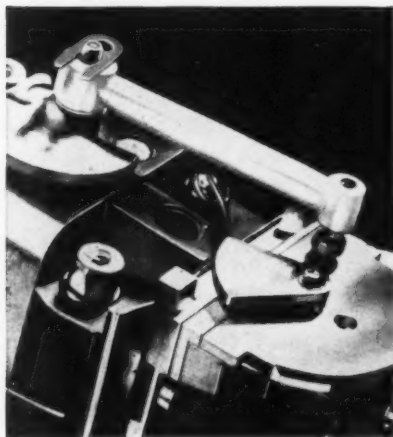
Corrosion resistance

"Zytel" resists common corrosive materials—esters, ketones, common solvents, alkalies and weak acids. Illustrated above is a joint-nut liner of "Zytel."



Abrasion resistance

"Zytel" has outstanding resistance to wear. Gears, cams and rollers of "Zytel" frequently have a much longer service life than other materials.



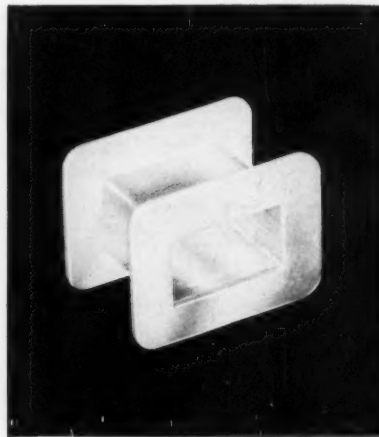
Shock resistance

"Zytel" has outstanding resistance to shock—even in thin sections. Molded parts of "Zytel" like this connecting rod damp vibration . . . operate quietly.



Needs no oiling

"Zytel" has a very low coefficient of friction. Moving parts of "Zytel" often need no oiling . . . cut down time . . . reduce maintenance costs.



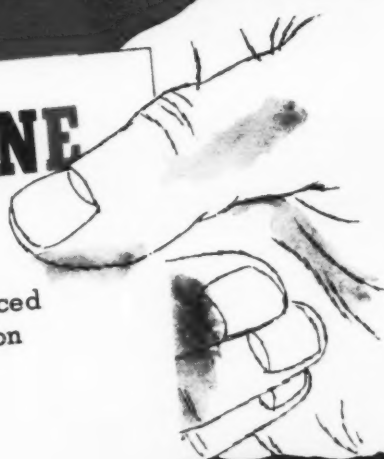
Lightweight

"Zytel" has a specific gravity of 1.14. Parts like these coil forms have good heat resistance at temperatures to 250°F. And their dielectric properties are excellent.

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MPM extruders and auxiliary equipment are recognized all over the world for their versatility and long, trouble-free service.

Their superior design and construction, and unexcelled heat control system result in better extruded products, produced at speeds which challenge comparison.

Details on this MPM "packaged unit" for extruding polyethylene and polyvinyl chloride roll flat tubing, and on individual extruders to meet your other requirements will be sent on request.

Inspect MPM's New
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Plio-Tuf

NOW you can turn out highly impact-resistant, heat-resistant, molded goods at injection speed with PLIO-TUF. This great, new, high styrene copolymer is now available in the first of a series of convenient to use, granulated colored compounds.

The new PLIO-TUF pigmented granules permit injection molders to capitalize on these outstanding features of the PLIO-TUF resins: Unmatched impact strength. Unusual high heat resistance. Hardness. Rigidity. High tensile strength. Excellent chemical and electrical resistance.

PLIO-TUF color granules are especially made for injection molding in conventional equipment at normal temperatures. Molding characteristics allow close tolerances to be met. Stability of color is excellent and scrap has been recycled with negligible changes in color and physical properties.

Not only for use in injection molded products, color compounds can be extruded into wide sheets for post-forming intricate shapes of almost any size. PLIO-TUF resins are also available in powder form for color compounding in your own equipment.

If you mold, extrude or post-form plastics, and toughness and durability are what you're looking for, then investigate PLIO-TUF today. A postcard or letter will be answered promptly with literature, followed by samples and full technical help. Just write to:

Goodyear, Chemical Division, Akron 16, Ohio

SEE THE PLIO-TUF RESINS—featured in Goodyear Chemical Division exhibits at the Basic Materials Show—May 17-20, 1954—Chicago—and the National Plastics Exposition—June 7-10, 1954—Cleveland.



Use-Proved Products—CHEMIGUM • PLIOBOND • PLIOLITE • PLIO-TUF • PLIOVIC • WING-CHEMICALS—The Finest Chemicals for Industry



NOW YOU CAN ADD injection molding to many other methods of forming and fabricating the versatile **Plio-Tuf** resins. Easy molding **Plio-Tuf** is now available in pigmented granules. Photo courtesy The West Company.

Chemigum, Filobond, Filolite, Plio-Tuf, Pliovic-T. M.'s The Goodyear Tire & Rubber Company, Akron, Ohio

NEW CUMBERLAND

"STAIR-STEP" DICING METHOD

Dices **FULL RANGE** of Plastic Materials!

"STAIR-STEP" DICING MACHINE

Plastic sheet material enters machine at right and is processed into cubes below.

CUTS SHEET STOCK INTO UNIFORM CUBES!

Now You Can Choose From **TWO** Cumberland Dicing Methods

NEW "STAIR-STEP" METHOD is the "universal" dicing method. It dices the full range of plastic materials having widely varying physical properties.

WELL-KNOWN "NOTCHED-KNIFE" METHOD dices vinyl materials of medium plasticizer content, vinylidene chloride, and other materials having suitable physical properties.



NOTCHED-KNIFE DICING MACHINE

Cumberland's "Stair-Step" dicing method offers you a completely new method of dicing. Perfect cubes are cut from sheet stock in one shearing action! All sides of cubes are cut cleanly. Cubes or rectangular pellets may be produced in various sizes ($\frac{1}{16}$ " to $\frac{1}{2}$ ") by simply changing knives.

WRITE FOR COMPLETE INFORMATION!

This new dicing principle makes it possible to dice the full range of plastic materials, including polyethylene, vinyl, acetate, and nylon. Two standard machine sizes accommodate sheets up to 7" or 14" wide. Machines to handle greater widths specially built.

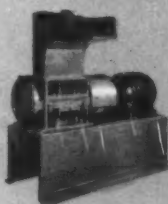
CUMBERLAND MANUFACTURES A COMPLETE LINE OF PLASTICS REDUCING MACHINES

Designed Specifically for Plastics . . . To Give You Maximum Operating Efficiency and Economy



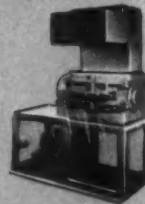
GRANULATING MACHINES (All Models)

Eight different models, direct coupled and V-belt driven, are available to meet your requirements. For complete details, request Bulletin 251.



20" ALL-STEEL GRANULATOR

Rugged machine for granulating large "difficult-to-process" plastic parts. Eliminates prior band-sawing. 8" x 20" throat opening.



PREBREAKER

Cuts up refrigerator panels, radio, television cabinets, polyethylene bottles and containers. Available with 20" x 32" or 10" x 24" throat opening.



California Representative:
WEST COAST PLASTICS DISTRIBUTORS, INC.
4113 West Jefferson Blvd., Los Angeles 16, Cal.

See us at the National Plastics Exposition, Cleveland, Ohio, June 7-10th Booth 562.



does the part you need
FIT HERE?

Hold your answer! We've got three more questions. Can your part be moulded by thermosetting methods? Can it be moulded with standard thermosetting materials or newer materials like Teflon, Alkyd or glass-reinforced plastics? Do you need quick deliveries in production quantities? Three "yes" answers, and your part problem's solved. We're custom moulders for *any* thermosetting job—with complete moulding facilities, including design and mould making. Phone or write *your* questions to Dayton or your local branch office.

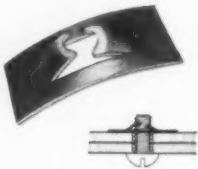
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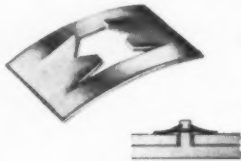
Kurz-Kasch

FOR OVER 37 YEARS PLANNERS AND MOULDERS IN PLASTICS



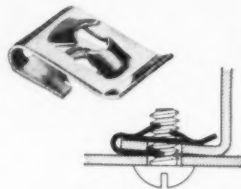
FLAT TYPE

One-piece self-locking spring steel fasteners. Replace threaded nuts, lock washers or spanner washers. Available in a wide variety of shapes and screw sizes.



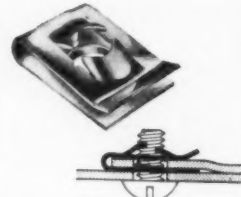
PUSH-ON

Zip over unthreaded die cast or plastic studs, rivets, nails, tubing, or wire to lock parts securely. Removable types available in many sizes.



"J" TYPE

Snap over edge of panels and into center hole locations. Hold themselves in place for blind assembly. Full range of panel thicknesses and screw sizes available.



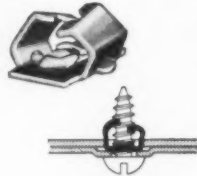
"U" TYPE

Perform same function as "J" type for reduced materials handling. Used where full bearing on lower leg of the SPEED NUT is required.



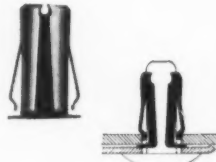
LATCH TYPE

Easily applied by hand, are self-retained in bolt-receiving position at center panel locations for blind attachments. Front mounting types are also available.



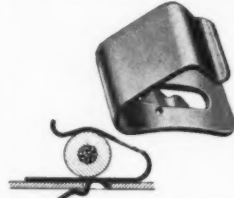
EXPANSION TYPE

For lightning-fast attachments in blind locations. Snap into mounting holes by hand. Screw spreads spring fingers, wedge-locks part in position. Secure, vibration-proof attachment.



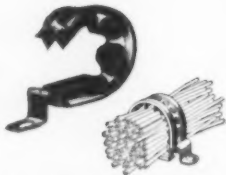
TUBULAR CLIPS

For use with unthreaded studs or rivets. Virtually "nails" panels together where there is access to one side only. Permanent lock or removable types.



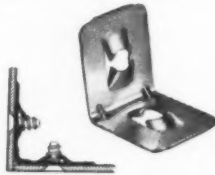
CABLE, WIRE, AND TUBE RETAINERS

Snap in place by hand, self-retained in position to receive wide range of cable, wire and tube sizes. Easily removed for service or re-location.



HARNESS CLAMPS

Open or close by hand — no tools needed. Attach to panel or pre-assemble to harness before installation. Cushioned to protect wires. Can not open accidentally.



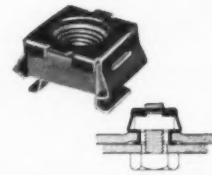
ANGLE BRACKETS

Combine bracket and fastener to reduce number of parts, speed up assembly and strengthen the structure. Variety of shapes and sizes.



HOSE CLAMPS

Self-locking, ratchet-type design, one-piece low profile construction — no bolts, nuts or thumb screws. Fast and easy to apply and remove for medium- and low-pressure connections.



NUT RETAINERS

Retain square nuts in blind locations. No welding, clinching, staking — snap in by hand. Provided in a wide range of screw sizes. "U" and "J" type retainers available.



Engineer Savings into your products with SPEED NUTS® — The Fastest Thing in Fastenings!®

Assembly cost savings from 30% to 75% . . . increased product quality . . . reduced materials handling . . . far less field service problems. These are a few of the reasons why more and more manufacturers are specifying SPEED NUT brand fasteners. Write today for your copy of "Savings Stories"—a

book full of cost-saving fastening reports. **TINNERMAN PRODUCTS, INC.**, Box 6688, Cleveland 1, Ohio. *In Canada:* Dominion Fasteners Ltd., Hamilton, Ontario. *In Great Britain:* Simmonds Aerocessories, Ltd., Treforest, Wales. *In France:* Aerocessories Simmonds, S. A., 7 rue Henri Barbusse, Levallois (Seine).

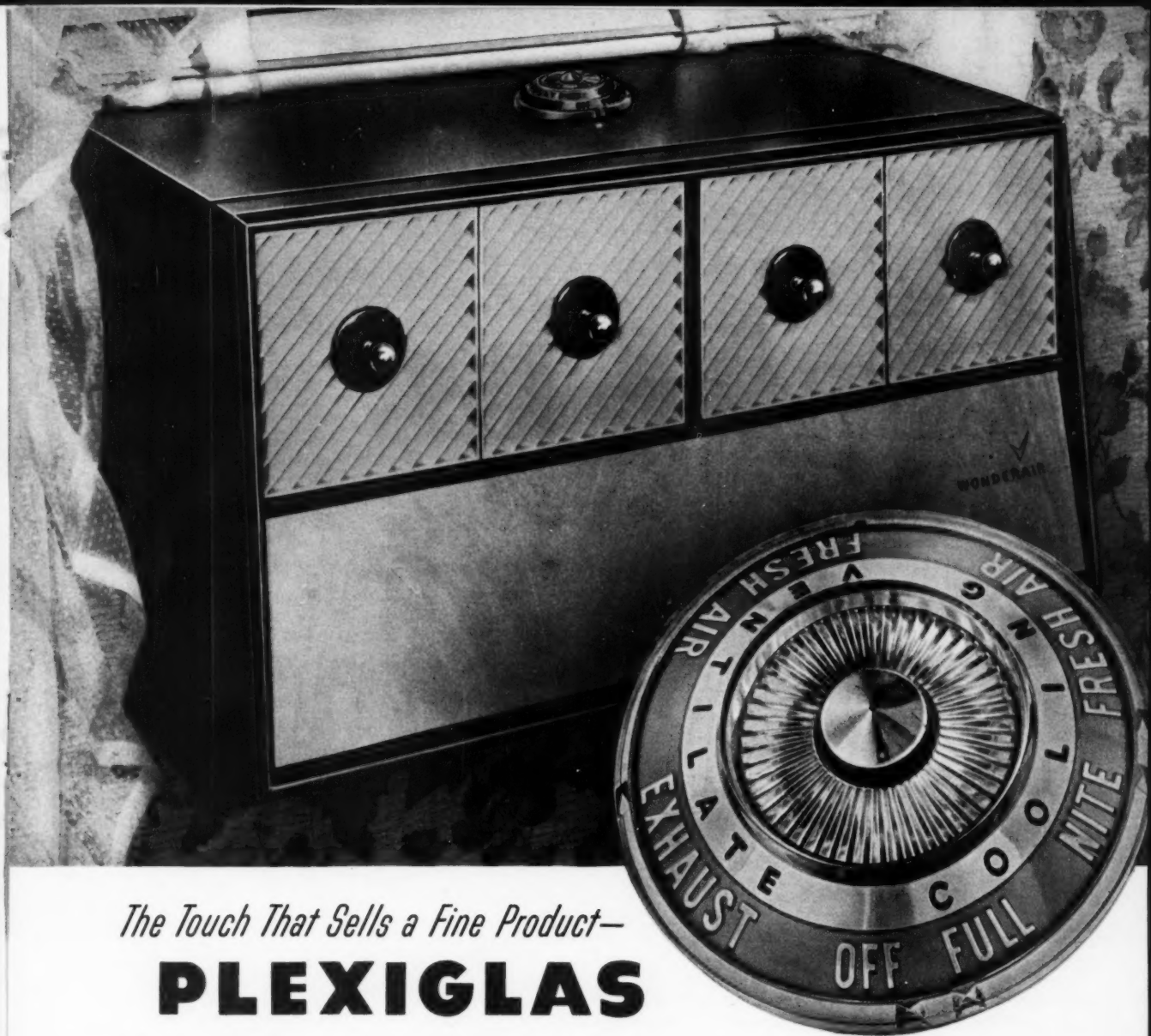
TINNERMAN

Speed Nuts®

MORE THAN 8000 SHAPES AND SIZES



Modern Plastics



The Touch That Sells a Fine Product— **PLEXIGLAS**

The moment customers see this colorful PLEXIGLAS control knob, a favorable impression is created. The knob does more than operate the air conditioner. Molded of PLEXIGLAS, it adds sales appeal.

Parts molded of PLEXIGLAS have a rich, brilliant appearance that stays fresh and bright for years. That is why this acrylic plastic, its durability proved by years of use for enclosures on aircraft, is used by manufacturers in other fields for decorative and functional parts such as trademarks, nameplates, dials, lenses, and instrument panels.

PLEXIGLAS can add a final touch of sales power to *your* product. We will be glad to tell you how.

PLEXIGLAS

molding
powder
product
design

This new brochure contains detailed information on the design of molded PLEXIGLAS parts. We will forward it promptly on request.

Please send me a copy of "Molding Powder Product Design".

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Firm.....
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ROHM & HAAS COMPANY

WASHINGTON SQUARE, PHILADELPHIA 5, PA.

Representatives in principal foreign countries

PLEXIGLAS is a trademark, Reg. U.S. Pat. Off. and other principal countries in the Western Hemisphere.

Canadian Distributor: Crystal Glass & Plastics, Ltd., 130 Queen's Quay at Jarvis Street, Toronto, Ontario, Canada.



Famous Names IN AIR CONDITIONING

Select materials, skilled hands and fine equipment attend the injection molding and finishing—by Amos—of the typical air conditioner fronts pictured above.

Names of dramatic distinction in many different industries rely on Amos for their plastics requirements:

product design and engineering . . . mold building . . . molding with 4 to 300 ounce machine capacity . . . conveyORIZED assembly and finishing . . . vacuum plating . . . silk screening . . . hot stamping . . . roller coating . . . printing . . . spray painting —everything a product needs in plastics—under one roof—no divided responsibility.

Often, Amos can provide for future model changes by skilled preparation of the *original* mold—thus sharply reducing model “changeover” costs. We invite you to join the evergrowing list of Amos customers. No obligation—write, wire or phone your inquiry to:

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Offices: Chicago, Detroit, Philadelphia, Kansas City, Mo., Nashua, N. H.

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your first call

to see the latest
in plastics molding
equipment



THE HYDRAULIC PRESS MFG. COMPANY
MOUNT GILEAD, OHIO

NOBODY HAS AS MUCH EXPERIENCE AT MOLDING POLYETHYLENE AS

TUPPER!

The logical molder for you to consult regarding that product or package of yours which is to be made of polyethylene is Tupper. Tupper has done more than any other molder to make molded polyethylene a practical reality.

Aside from having designed, patented, and promoted successful seals, closures, and dispensers for polyethylene containers, the Tupper Corporation has vast experience in every phase of polyethylene packaging and polyethylene injection molding. This experience will be of major importance in improving your product, in reducing your costs, when Tupper goes to work for you.

Tupper's combination of experience, technical ingenuity, and the most modern equipment is at your service for the custom molding of your product in polyethylene. You can do no better than the best ...and the best at molding polyethylene is Tupper!

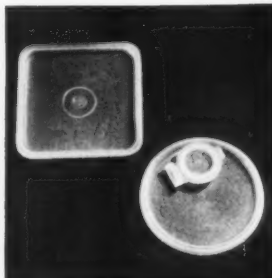
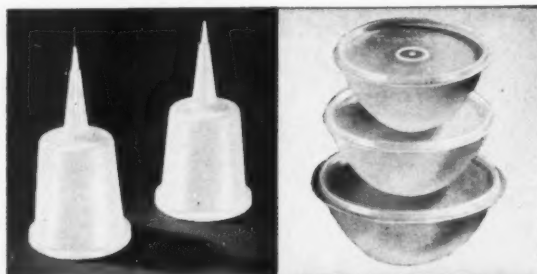
TUPPER!
TRADE MARK

TUPPER CORPORATION

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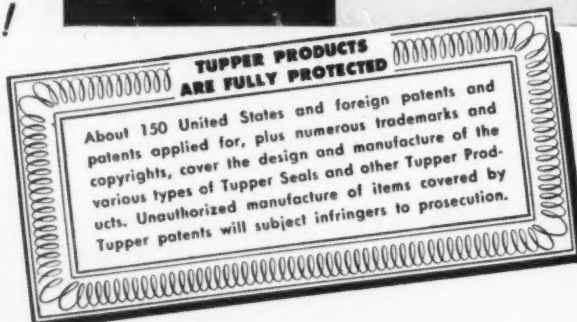
Address All Communications To:
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Tupper Seals are air and liquid-tight flexible covers. The famous Pour All and Por Top covers are designed for easy dispensing. They are made in sizes to fit all Tupperware containers.



When equipped with Tupper Seals, Tupper Canisters, Sauce Dishes, Wonder Bowls, Cereal Bowls and Funnels in various sizes are the most versatile reusable containers you have ever seen.





The Fatal Marriage



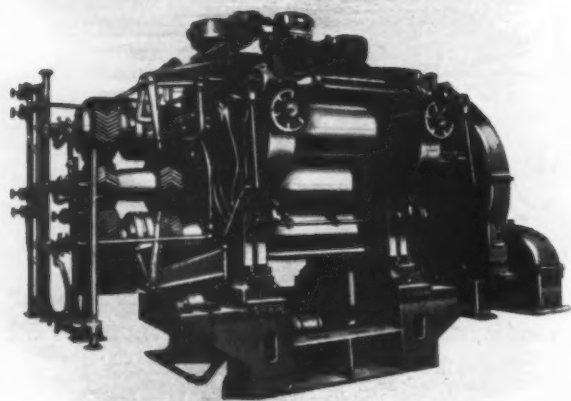
PLASTICS ENGINEERING COMPANY
Sheboygan, Wisconsin

A Lion, touched by the graciousness of a Mouse who had done him a service, and resolved not to be outdone in generosity, asked the mouse to name his own terms. The Mouse, fired with ambition at this gracious offer, did not so much consider what was proper for him to ask as what was in the power of his prince to grant. So he presumptuously demanded the Lion's princely daughter in marriage. The Lion consented. But when he had the princess in his possession, she, like a giddy thing that she was, not minding how she walked, let her paw fall upon her spouse, and crushed her little dear to pieces.

Consider well before making a choice else we shall find ourselves in worse circumstances. — Aesop

Investigation will show that you may rely upon Plenco to have a complete understanding of your requirement in phenolics . . . for every application.

*There is
a range of*
SHAW
precision Calenders



Designed for production efficiency, economy and reliability, Shaw Precision Calenders are made with two to four bowls for all type of synthetic and rubber materials. Refinements of design include bored and drilled rolls for heating and cooling, flood lubrication to the roll bearings and hydraulically operated zero clearance.

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from one-inch "Midgets"

to 6 FOOT GIANTS

... "commonwealth *Plastics*

proves

"It Can be Done"



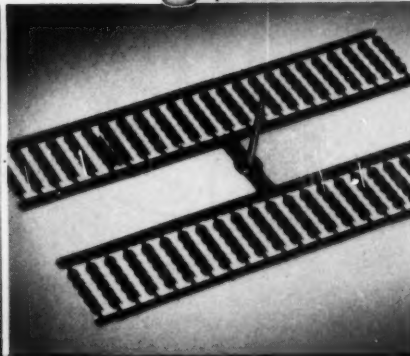
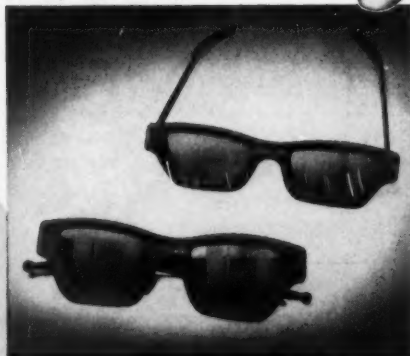
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FIRST to manufacture 3-D Plastic glasses,
Commonwealth began at the design
stage ... pushed production to a million
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... from 1 to 225 cavities
per mold.

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Fiore electroformed metal masks and spraying equipment

Precision-fit Fiore masks often spell the difference between a low cost, first rate paint job and sloppy decorating that costs far more than it ought to. Fiore masks assure sharply defined edges and close registration of colors. They are *engineered* by *specialists* who have designed and built all types of masks for some of the country's leading, most particular molders.

SPRAYING EQUIPMENT—Quality in spray painting plastics depends on having jigs, fixtures, spray guns and booths which allow you to use your masks with maximum efficiency and speed. Fiore spray equipment is engineered to the same high quality as Fiore masks.

Write today for additional details. Include samples or drawings for estimates on electroformed masks that will insure precision spraying.

WM. M. FIORE INC.

135 Liberty Street

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Typical products decorated with Fiore elec-

troformed masks and spraying equipment.



supported or
unsupported

Outerwear of Vinyl

*Looks better
Costs less to produce
when you weld with*

Thermatron

HIGH FREQUENCY SEALING AND HEATING EQUIPMENT



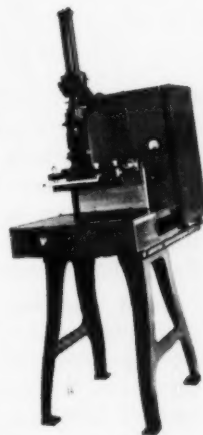
The latest look in fashion is plastic . . . jaunty simulated leather jackets, sparkling vinyl raincoats, belts, collars and accessories of every sort. And the most practical way is to weld with Thermatron. Then you avoid trouble—some perforations that lead to rips and tears.

Thermatron produces a permanent waterproof bond stronger than the material itself . . . Does it cheaper and better than any other method. Outerwear is welded in seconds, cutting production costs drastically. Seams are smooth and even — producing a better looking garment too!

Outerwear is just one segment of plastic fabrication where Thermatron can help you. What do you manufacture? We'll run tests on your own material and offer sound recommendations . . . all without obligation, of course. Write today for comprehensive bulletin No. 84



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ELECTRONICS
SINCE 1922



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for **TOUGH** molding jobs...



METASAP® STEARATES

deliver easier mold release

HAVE you tried Metasap Zinc or Calcium Stearates for easy ejection from the mold of intricate shapes, for deep drawing, or for larger-than-average pieces? You'll find they give just the results you want.

Blend these fine stearates into the molding compound—or sprinkle them on the molding surface. Either way, you'll find you need lower ejection pressures, get higher output, fewer rejects, better finished products. Molds last longer too.

So specify compounds containing Metasap Stearates or incorporate them into your own molding compound. Metasap Technical Service will gladly help you find the materials and mixing procedures best fitted to your production methods.

And to produce economical plastigels . . . Metasap offers a complete line of quality stearates, effective as thickening agents. Free testing samples of Magnesium, Barium, Calcium, or Aluminum Stearates are yours on request.

Reg. U. S. Pat. Off.



METASAP CHEMICAL COMPANY, Harrison, N. J.

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Stearates

of Calcium • Aluminum • Lead • Magnesium • Zinc

Bigelow fiber glass mats perform hard jobs easier, better, at lower cost!

Here's why . . .

1. Greater *uniformity*. Bigelow mats give you the very highest standards of *consistent uniformity*.
2. Greatly improved drapability. They conform readily to shapes with little tendency to "bridge" or return to the unformed state.
3. Wide choice of resins. Lack of chemical binder means greater compatability.
4. Better wetting out. Better bonding and less possible fiber-resin adhesion loss, and consequently improved laminate strength.
5. Greater translucency. Especially useful in decorative laminates.
6. High wet-strength retention. No chemical binder is present to destroy finishes applied to fiber. Latest type sizes available.
7. Higher glass-resin ratios, due to all-glass construction.
8. Smaller inventory required due to versatility of mats for a wide range of products.
9. Wide range of weights available—from 2 to 8 ounces.

A Bigelow product for every job:

FORMAT*—A mechanically bound all-purpose mat which can be used to advantage in almost all the ordinary applications a molder is likely to encounter. It consists of a controlled blend of chopped roving which has been mechanically bound to a thin carrier mat. FORMAT's easy drapability is probably the outstanding reason for its widespread popularity.

ROVMAT*—Bigelow's high tensile strength unidirectional mat has continuous strands of roving uniformly distributed in the longitudinal direction on a base of chopped strands and lightweight carrier mat. ROVMAT is well adapted to applications where major stresses are applied in one direction. Also makes an easy sandwich construction.

*Patents pending

FABMAT*—Constructed of a base layer of woven glass fabric to which a controlled blend of chopped roving is mechanically attached. Any glass fabric may be used. FABMAT comes as close to being a "preform" for sandwich work as possible. It obviates the time and labor expense consumed in cutting and matching layers of cloth and mat.

Bigelow mats can be further engineered to meet specific applications. Available in weights from 2 to 8 oz. per square foot. Heavier weight available on order. Their lack of resinous binder offers the molder and laminator a versatile reinforcing material.

ROVCLOTH—another addition to the Bigelow line! A woven roving available in various constructions and in widths up to 144".

FOR THE MATCHED METAL DIE MOLDER
All mats can be "Textured" which completely eliminates "wash" tendencies.

WHY WORRY WITH WASTE—let us furnish you with ready-cut patterns.

Custom woven fabrics available in widths up to 144 inches.

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BIGELOW



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Fiber Glass Products

A division of Bigelow-Sanford Carpet Co., Inc.,
140 Madison Avenue, New York City



Consolidated

"your blueprint in plastics"



...where you profit by our molding experience

● This brief picture-tour of the 135,000 square feet Consolidated plant takes you into several of the departments which contribute important skill and know-how to the process of transforming raw plastic resins into saleable finished products.

When you are planning for plastics, just remember that Consolidated has exhibited its skill in custom molding by satisfactorily completing over 9,500 individual jobs! Our operation encompasses every phase of the business, using the most modern equipment and production techniques. Your inquiry to our nearest office will bring a return of low-costs and quality products.

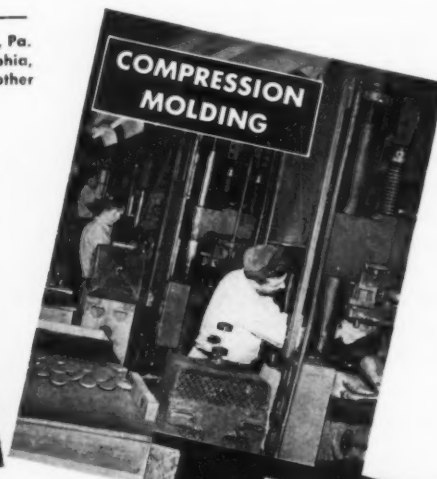
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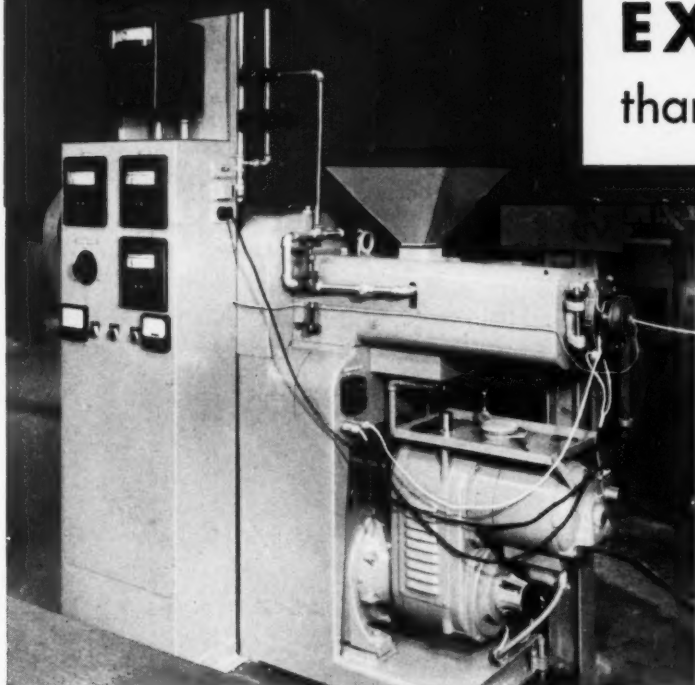


Why U. S. Stoneware Co.

operates more

NRM EXTRUDERS

than any other make



NRM 1 1/2" Electrically Heated Thermoplastics Extruder — one of two similar units used for compound development and pilot operations in U. S. Stoneware Co. Laboratories.

U. S. Stoneware Company, makers of internationally famous Tygon Plastic tubing and other products, has this to say about NRM Thermoplastic Extruders:

"We have ample opportunity to compare various extruder makes right in our own plants, and are particularly impressed with the higher performance of our NRM's. Their greater flexibility helps solve production problems and keeps output at top levels . . . saves time on changing from one plastic to another. Their ability to duplicate experimental runs precisely, helps reduce both time and cost of compound development. We keep two 1 1/2" NRM's busy on laboratory work and many bigger ones on production. In fact, we operate more NRM Extruders than any other make."

Here are a few of the time-saving, cost-cutting features that enable NRM Extruders to earn greater profits for owners . . . features that prompt leading plastics producers . . . like U. S. Stoneware and many others all over the world — to *standardize* on NRM:

- **STURDY, CORROSION-RESISTANT CONSTRUCTION** assures long, trouble-free life.
- **PATENTED SCREW DESIGNS** meet every extruding requirement.
- **BALANCED HEAT CONTROL** assures uniform, straight-line heating.

- **QUICK-OPENING DIE GATES** reduce unproductive setup time.

There are many others, and your postcard brings full details promptly. If you are planning to purchase plastic extruding equipment, get complete information on NRM, the only *complete* line, **TODAY**. Read the facts for yourself, and make your next extruder an NRM.

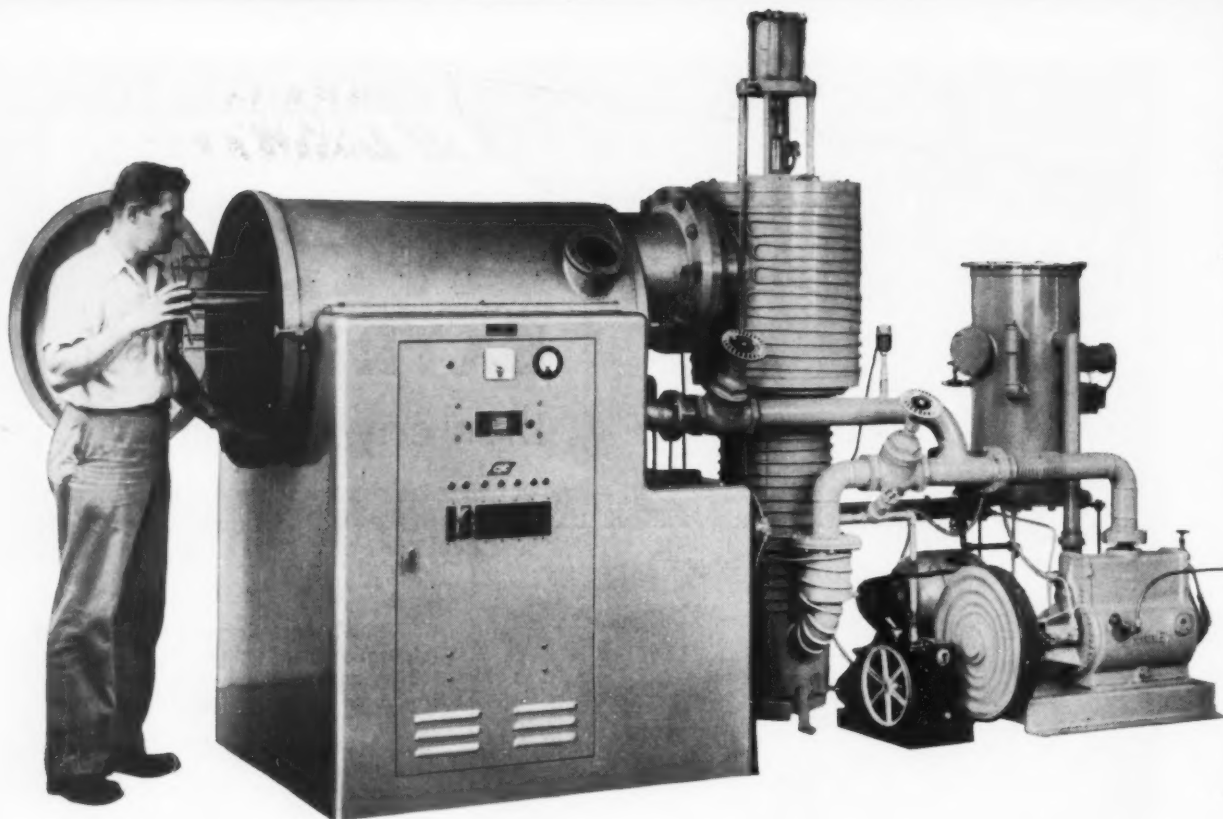
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Export: Omni Products Corporation, 460 Fourth Ave.,
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Available from stock

CVC's new 30-inch high vacuum metallizer

This new CVC high vacuum coater, Model LC1-30, was specifically designed to meet the demands for a moderate sized high vacuum metallizing unit.

You don't need to be a high vacuum engineer to set up and operate this new CVC coater. It comes complete with all necessary controls—need only be connected to service lines. Here are the details:

- Compact and easy to operate, all cycle switches and valves accessible from one point.
- Simple and inexpensive fixtures are available for either front or second surface coating.

- Two 35-inch long-work holding fixtures will each accommodate over 200 pieces of plastic or metal 1½" in diameter.
- The short cycle time—4 to 5 cycles per hour—gets the work out in a hurry.

If you've been looking for a high vacuum coater that's neither too big nor too small, CVC's Model LC1-30 is your answer. For complete details, write to *Consolidated Vacuum Corporation, Rochester 3, N. Y.* (a subsidiary of Consolidated Engineering Corporation, Pasadena, California).



Consolidated Vacuum Corporation
Rochester 3, N. Y.

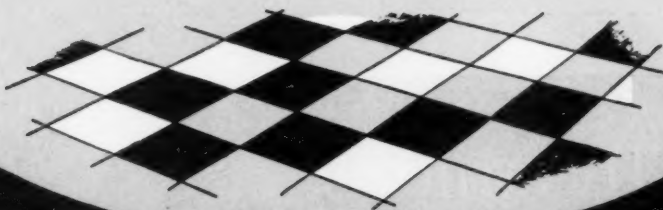
designers and manufacturers of high vacuum equipment
SALES OFFICES: PALO ALTO, CALIF. • CHICAGO, ILL. • CAMDEN, N. J. • NEW YORK, N. Y.



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More service from Monsanto . . .

for FLOOR TILE, Monsanto DIDP



INCREASES FLEXIBILITY, ELIMINATES BLISTERING

The calendered vinyl floor tile of a large producer was blistering, chipping and becoming stiff. The manufacturer's staff worked closely with Monsanto's technical service group on this problem. Together, they solved it by using diisodecyl phthalate and Santicizer 160.

This combination eliminated the processing troubles and gave several other advantages. DIDP added superior resistance against 5% alkali solutions, lowered volatility, increased flexibility and was non-shrinking. Santicizer 160 speeded processing, increased resistance to stains and grease, and reduced cost.

Other Monsanto plasticizers can help you, too. Monsanto tricresyl phosphate and Santicizer 140, for example, are ideal for imparting flame resistance to your products. For more information call your nearest Monsanto office or write Organic Chemicals Division, MONSANTO CHEMICAL COMPANY, Box 478, St. Louis 1, Missouri.

Santicizer: Reg. U. S. Pat. Off.



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*Write for information on your specific problems;
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Mechanical Sculptor

CARVES BIG MOLDS

With feather-light touch, the tracer of this huge die sinking machine passes over the surface of a master pattern. The slightest change in contour is transmitted by a varying electric current to the cutter, which faithfully reproduces every intricate detail of the pattern in the mold cavity.

From the mold shown, Bridgeport Moulded Products Co., Inc. produced the handsome

grille of the Philco air conditioner pictured in the inset—one of the hundreds of fine products for which molds have been created by the skilled hands and modern facilities at Newark Die Company.

Big molds have been a big factor in the growth of the plastics industry. For more than 30 years Newark Die has led in the design and construction of all types of molds.

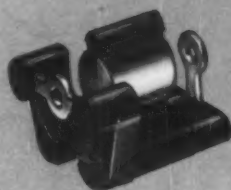
NEWARK DIE COMPANY

23 SCOTT STREET, NEWARK 2, N. J.

Phone: MA 2-3305



Before



After



ROGERS RX 525 REDUCES BRACKET COST BY 35%

THREE METAL PARTS ELIMINATED

High strength of RX 525 plus the fact that it can be drilled and tapped eliminated the need for metal mounting lugs. In the new bracket these lugs are plastic and integral parts of the molded piece. Parts cost was reduced 8 cents — from 23 cents to 15 cents per bracket.

MOLDING OPERATION SAVED

In doing away with the metal lugs, the molder also eliminated the special handling involved in loading them into the mold. Result: a 35% increase in molding production, using a 4-cavity transfer mold.

Rogers RX impact phenolics should be considered when you want strength in combination with low cost production. RX 525 is one of a series of phenolics in the medium to medium high impact range. These impact phenolics can be automatically preformed (pourability is excellent). They are easy to mold and fast curing; pellet-size is uniform; molded appearance is good to excellent; they are dustless.

Want more facts? Write Dept. P, Rogers Corporation, Goodyear, Connecticut, or ask to see a technical representative.

Bracket is produced by Allen Electric & Equipment Company, Kalamazoo, Mich., for its electric meters.

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ELECTRICAL INSULATION for Motors, Transformers, Generators

PLASTICS — Molding Compounds and Laminates
SHOE MATERIALS for Counters, Midsoles, Liners



Modern Plastics

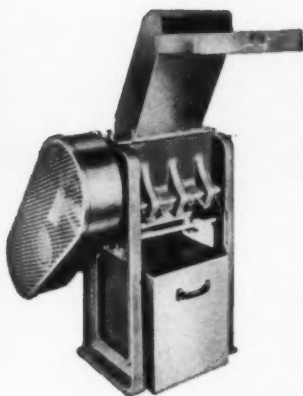
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DE MATTIA GRANULATORS

PROCESS ALL YOUR SCRAP

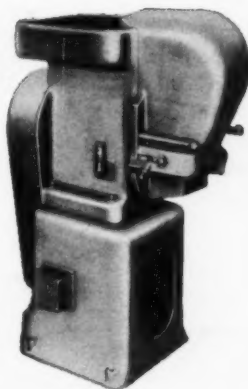


GRANULATOR No. 1



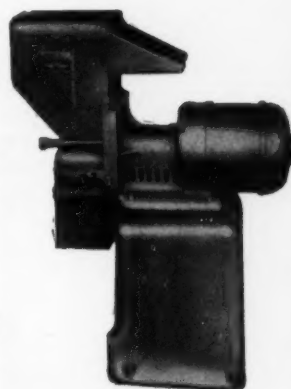
Simple, rugged and highly efficient. Has capacity of 200 lbs. per hour. 3 H.P. Motor with double V belt and Meehanite flywheel. Features high grade roller bearings with positive seal. Four cutting blades placed on a bias permit efficient cutting of thin strips in Vinyl, Saran, etc. Standard screen with $\frac{1}{2}$ " openings (other screen sizes on request). Floor space required 32" x 44"; net weight with motor (approx.) 800 lbs.

GRANULATOR No. 3



For low-cost salvage of the large slugs and chunks resulting from cleaning out the heating cylinder, accumulation at the nozzle and also those molded pieces too tough for the average sprue and scrap grinder. Capacity — Over 150 lbs. per hr. 3 H.P. Motor in Base. Double V Belt Drive. Heat treated Alloy Steel Rotor High Grade Roller Bearings with Positive Seals. Standard Screens with $1\frac{1}{32}$ " Openings (other sizes on order).

GRANULATOR No. 4



Recommended for at-the-machine operation. Available with or without base. Capacity 75 lbs. per hour; 2 H.P. Motor 1200 RPM; Direct spline drive; Solid semi-steel hopper; High grade roller bearings with positive seals; Standard screen with $1\frac{1}{32}$ " opening; Overall dimensions 34" long, 12" wide, 23 $\frac{1}{2}$ " high (from bench); Hopper opening 9" by $4\frac{1}{4}$ "; Net weight 375 lbs. without base; 500 lbs. with base.

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Get the Right FILM SLITTER



BELOW: A few of the modifications available on the popular CAMACHINE Type 26 slitter-rewinder.

26-E-7 — razor blade slitting at speeds up to 700 fpm.

26-V — score-cut slitting with built-in automatic web tension.

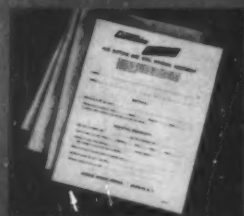
26-S1 — Sealcut* — heat seals edges of strips instantly as it cuts.

26-3(RM) — both score-cut slitting elements and razor blade slitting attachment.

CAMACHINE DATAFORM

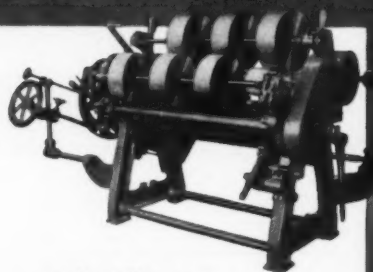
Use this simplified form to get a prompt recommendation on the right equipment for your roll production job. Write today for your copy of the Dataform.

*Registered Trade Name

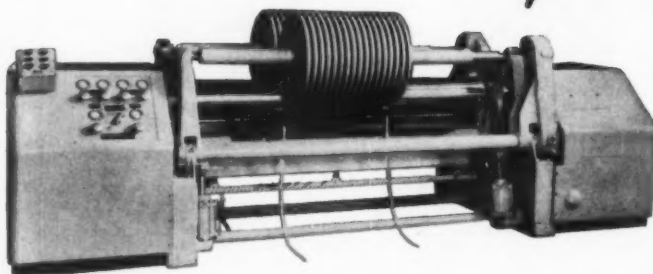
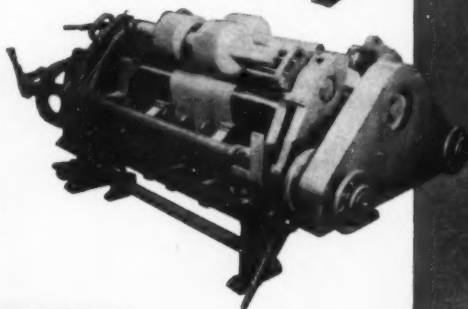


First, consider your roll production requirements. Then consult with Camaron engineers. Investigate modifications designed to meet your exact slitting and roll winding needs. You'll wind up with a machine custom-fitted to your job — a CAMACHINE!

TYPE 26 — For light to heavy gauge plastic films. Rated at speeds up to 500 fpm. Score-cut slitting; combination surface and center rewinding; positive roll separation.



TYPE 28 — For light to heavy gauge plastic films. Rated at speeds up to 800 fpm. Choice of score-cut or shear-cut slitting; combination surface and center rewinding; positive roll separation.



TYPE 29 — A heavy-duty machine rated at speeds up to 1500 fpm. 36" diameter rewind capacity. Score-cut slitting; combination surface and center rewinding; positive roll separation.

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FOR PRODUCTS ON THE MOVE



Designed with Hercocel, these plastic barrettes are truly hair jewelry of exquisite beauty and outstanding quality.

"Hercocel particularly adapts itself to our intricate methods of decoration," says Mr. Claude Gresham, Vice President of Tip-Top Products Company, who like many other executives today has found Hercocel ideally suited for the manufacture of quality multicolor decorations by mass production methods.

Molded from Hercocel into thin-walled sections that will not snap when bent, they have the necessary flexibility and resilience. And Hercocel's ability to take lacquer better than other plastics contributes to the beauty of the seven seasonable colors in which the barrettes have been designed to complement every outfit a little girl wears.

For information on how Hercules is helping the plastics industry keep its products on the move, write:

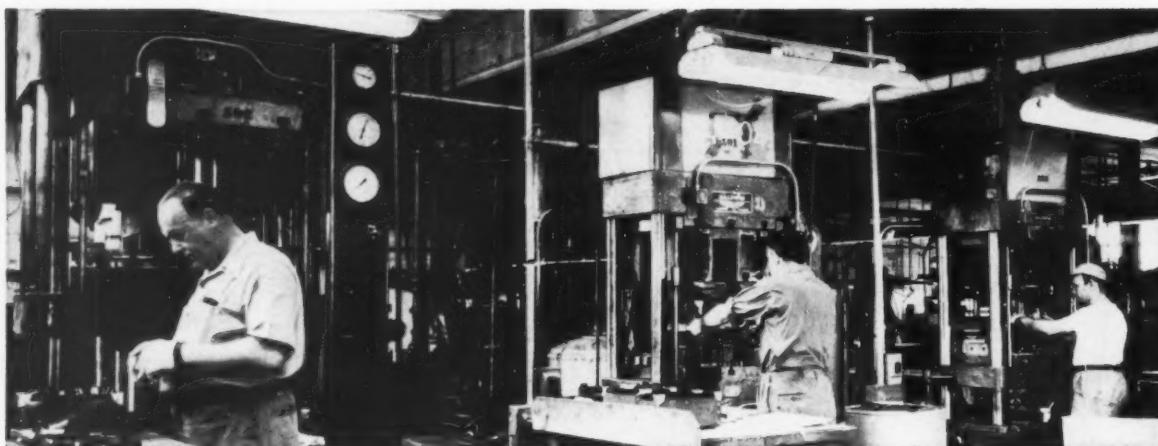


Watch-Mates Barrettes Cards retail at 59¢
Plastic Handbag with Barrettes retails at 98¢
by TIP-TOP Products Company, Omaha, Nebraska



Cellulose Products Department
HERCULES POWDER COMPANY

916 Market Street, Wilmington 99, Del.



Tech Art Plastics Company reports:

"Our Baldwin Presses up production 25%!"



Over half a century of experience adds extra significance to Tech Art Plastics Company's appraisal of its equipment. Mr. J. Hormick, Tech Art's Molding Superintendent, has this to say about the Baldwin presses they use to produce a wide variety of impact plastics for radios, appliances and other electronic equipment:

"We've gotten 25% more production from our Baldwin presses than from any other similar equipment in the plant. The units meet every high-speed production need.

"Both top plunger and molding clamping characteristics can be easily controlled and adjusted. So, with proper molding technique, these presses mold close

tolerance precision parts with a minimum of flash, saving us considerable finishing time.

"These versatile Baldwin presses handle compression molding jobs and plunger molding work with equal ease and efficiency."

Molding, pre-forming or laminating plastics . . . whatever your pressing problem, you can count on Baldwin to help you solve it. Please contact your B-L-H representative or write for the latest bulletins with complete data on Baldwin presses for the Plastics Industry. Address: Department 4826, Baldwin-Lima-Hamilton Corporation, Philadelphia 42, Pennsylvania.



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The boy with ideas...

You'll get ideas, too... once you see what "Dutch Boy" double-duty Plasticizers do for vinyls.

They're the "Dutch Boy's" newest idea... first primary plasticizers pre-balanced at the factory for control over *both* low temperature flexibility and low volatility at the same time. In vinyl film, sheeting, extrusions, plastisols and organosols, formulated to premium standards, they reduce cost.

Want *outstanding low temperature flexibility* plus good low volatility? "Dutch Boy" NL F-41 will give it to you. NL F-41 also imparts excellent hand and drape, good heat- and light-stability, low water extraction.

Want *good low volatility* while maintaining good low temperature flexibility? Use "Dutch Boy" NL F-21.

Want *excellent low temperature flexibility balanced with good low*

THE NEW "DUTCH BOY" PLASTICIZERS

Three Double-Duty Primary Plasticizers

PRODUCT	USED FOR —
NL F-41	Outstanding low temperature flexibility Good low volatility
NL F-31	Excellent low temperature flexibility Good low volatility
NL F-21	Good low temperature flexibility Good low volatility

Four High-Purity Standard Plasticizers

NL C-20 (Di-2-ethylhexyl Sebacate)
NL A-10 (Dibutyl Phthalate)
NL A-20 (Di-2-ethylhexyl Phthalate)
NL A-30 (Di-isooctyl Phthalate)

...this time, it's double-duty plasticizers

volatility at moderate cost? Try "Dutch Boy" NL F-31.

Besides the three double-duty plasticizers, National Lead also makes four exceptionally pure, standard-type plasticizers. All seven conform to the high standards of the name you know for quality... "Dutch Boy."

A leader in stabilizers, too.

Twelve "Dutch Boy" Stabilizers have found their place at the top in vinyl production... Normasal for vinyl flooring... Tribase & Tribase E

for electrical insulations... Plumb-O-Sil C for brightly colored translucent film... Dyphos for opaque, outdoor products... to name a few.

By teaming up these twelve "Dutch Boy" Stabilizers with the seven new "Dutch Boy" Plasticizers, you get a hard-to-beat group of chemicals. Write for detailed technical data... on your letterhead, please.



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to 6 lb. capacity.



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HENDERSON

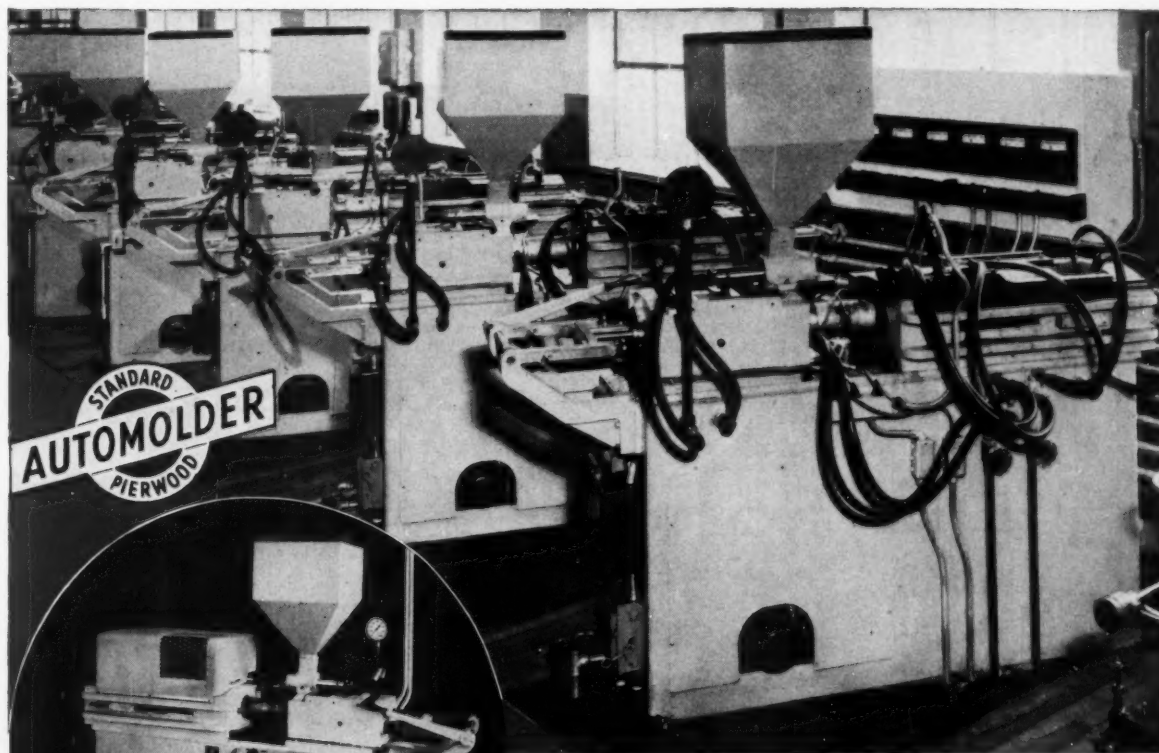


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AUTOMOLDER
PIERWOOD

Photos Courtesy Queen Products, Providence, R.I.

1½ oz. Capacity
1200 Shots per hour
30 lbs. per hour
9 x 10 Mold space
12¾ Daylight
6¾ Max. stroke

Patent Applied For



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The Standard Pierwood Automolder

offers positive mold protection against closing on unejected parts. One 15 hp. motor operates three machines with Vickers pump and control valves. Complete, positive and simple mechanical controls. No timers necessary. A demonstration will convince you.

LOW

MOLD COST
MAINTENANCE
LABOR COST
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REJECT PARTS

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of quality extrusions,
try Diamond

PVC-50



Section of refrigerator door gasket made of DIAMOND PVC-50.

If you want a polyvinyl chloride resin that has all the properties required to produce high quality extrusions with speed and economy, try DIAMOND PVC-50.

The excellent dry blending qualities of PVC-50 reduce mixing time and permit blending with a minimum of equipment and capital investment. The blended materials flow freely, have excellent heat stability and extrude freely as can be seen from the sample at the left.

The outstanding properties of DIAMOND PVC-50 result from constant quality control by DIAMOND technicians at every production stage ... from raw materials to finished resin, plus the facilities of the world's newest, most modern PVC plant.

For technical information and assistance, call your nearest DIAMOND Sales Office, or write DIAMOND ALKALI Co., 300 Union Commerce Bldg., Cleveland 14, Ohio.

DIAMOND ALKALI COMPANY CLEVELAND 14, OHIO





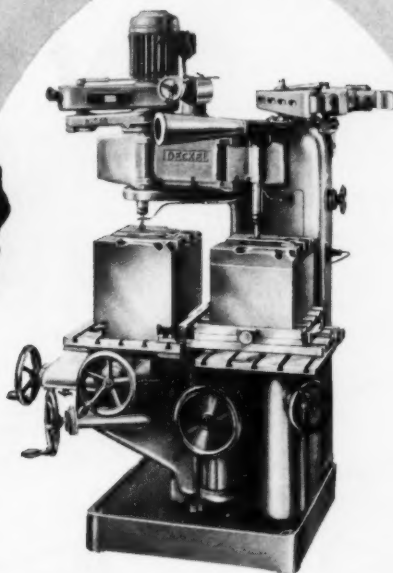
ECONOMICAL, ACCURATE PRODUCTION

OF DIES AND MOLDS
WITH THE LATEST

DECKEL

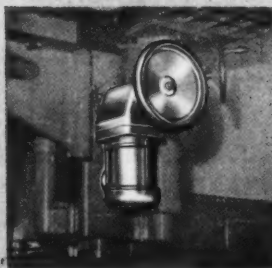
universal pantograph DIE SINKING MACHINE model KF12

Deckel die sinking machines are justly famous for their accuracy, production rate, and ease of operation. The KF12, latest and largest Deckel model, does heavy die-sinking jobs which formerly required much greater investment in equipment. Spindle speeds from 60 to 10,000 r.p.m. enable you to do rough and finish milling, as well as light engraving, on the same machine. The newly developed, "mirror image" milling attachment produces right and left hand dies and molds from the same pattern. Other important features are illustrated below.



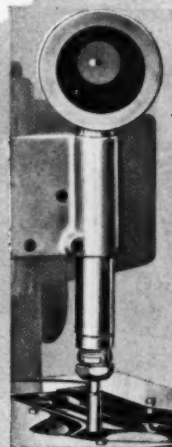
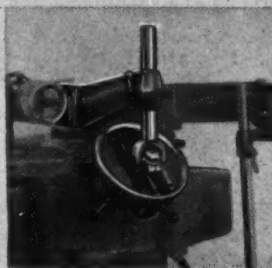
Deckel KF12 makes rapid, accurate enlargements or reductions from 1:1.5 to 1:4 as well as 1:1 duplication. The cutting tool covers an area up to 15 $\frac{3}{4}$ " x 15 $\frac{3}{4}$ " or up to 10" x 19 $\frac{3}{4}$ ".

Optical contacting device makes rough milling faster, more accurate. And, accurate rough milling reduces time for finishing.



Saddle elevating motor rapidly raises or lowers master and work-piece at the same time.

Circular forming attachment permits generating spherical shapes.



Get in touch with us soon for information on this or other Deckel machines:

2-DIMENSIONAL ENGRAVERS • 3-DIMENSIONAL ENGRAVERS
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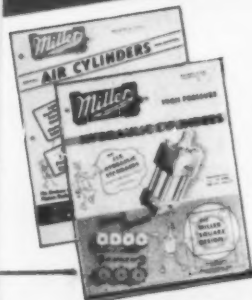
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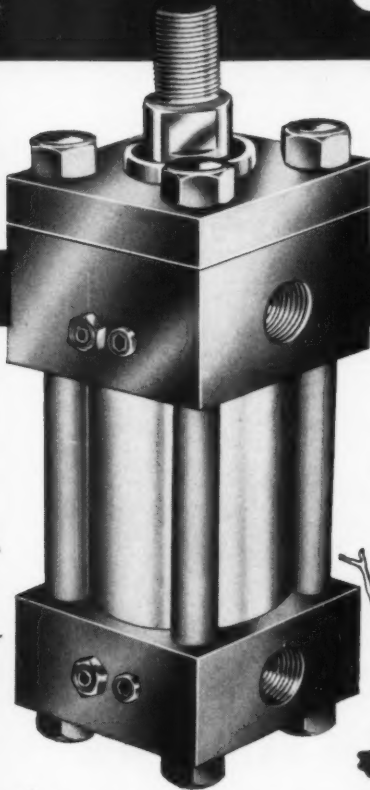
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PRICES OF MOUNTING ATTACHMENTS ONLY



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Foot
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Pivot
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			AIR A53	HYD. H53	AIR A77 A71	HYD. H77 H71	AIR A61 A62	HYD. H61 H62	AIR A86	HYD. H86 H88		
1 1/2"	2"	Non		\$58.50		\$2.90		\$8.20		\$14.35		
1 1/2"	4"	Non		60.70		2.90		8.20		14.35		
1 1/2"	6"	Non		62.90		2.90		8.20		14.35		
1 1/2"	8"	Non		65.10		2.90		8.20		14.35		
1 1/2"	11"	Non		68.40		2.90		8.20		14.35		
2"	2"	Non	\$37.70		\$2.05		\$4.60		\$6.90			
2"	4"	Non	39.40		2.05		4.60		6.90			
2"	6"	Non	41.10		2.05		4.60		6.90			
2"	8"	Non	42.80		2.05		4.60		6.90			
2"	11"	Non	45.35		2.05		4.60		6.90			
2"	3"	Both	62.05	94.50	2.05	2.95	4.60	8.55	6.90	17.05		
2"	5"	Both	63.75	97.00	2.05	2.95	4.60	8.55	6.90	17.05		
2"	7"	Both	65.45	99.50	2.05	2.95	4.60	8.55	6.90	17.05		
2"	9"	Both	67.15	102.00	2.05	2.95	4.60	8.55	6.90	17.05		
2"	13"	Both	70.55	107.00	2.05	2.95	4.60	8.55	6.90	17.05		
2 1/2"	2"	Non	41.45	73.30	2.25	2.95	4.80	9.00	7.55	19.80		
2 1/2"	4"	Non	43.35	76.00	2.25	2.95	4.80	9.00	7.55	19.80		
2 1/2"	6"	Non	45.25	78.70	2.25	2.95	4.80	9.00	7.55	19.80		
2 1/2"	8"	Non	47.15	81.40	2.25	2.95	4.80	9.00	7.55	19.80		
2 1/2"	11"	Non	50.00	85.45	2.25	2.95	4.80	9.00	7.55	19.80		
3 1/4"	3"	Both	77.80	126.85	2.55	4.35	6.35	11.75	9.90	23.10		
3 1/4"	5"	Both	79.80	129.85	2.55	4.35	6.35	11.75	9.90	23.10		
3 1/4"	7"	Both	81.80	132.85	2.55	4.35	6.35	11.75	9.90	23.10		
3 1/4"	9"	Both	83.80	135.85	2.55	4.35	6.35	11.75	9.90	23.10		
3 1/4"	13"	Both	87.80	141.85	2.55	4.35	6.35	11.75	9.90	23.10		
4"	2"	Non	56.25	106.00	2.85	5.15	6.70	12.90	11.05	26.80		
4"	4"	Non	58.85	109.40	2.85	5.15	6.70	12.90	11.05	26.80		
4"	6"	Non	61.45	112.80	2.85	5.15	6.70	12.90	11.05	26.80		
4"	8"	Non	64.05	116.20	2.85	5.15	6.70	12.90	11.05	26.80		
4"	11"	Non	67.95	121.30	2.85	5.15	6.70	12.90	11.05	26.80		
5"	3"	Both	98.25		3.15		7.00		12.35			
5"	5"	Both	101.65		3.15		7.00		12.35			
5"	7"	Both	105.05		3.15		7.00		12.35			
5"	9"	Both	108.45		3.15		7.00		12.35			
5"	13"	Both	115.25		3.15		7.00		12.35			
6"	2"	Non	80.60		3.35		7.25		13.55			
6"	4"	Non	84.90		3.35		7.25		13.55			
6"	6"	Non	89.20		3.35		7.25		13.55			
6"	8"	Non	93.50		3.35		7.25		13.55			
6"	11"	Non	99.95		3.35		7.25		13.55			
8"	3"	Both	157.35		3.70		10.55		17.60			
8"	5"	Both	162.45		3.70		10.55		17.60			
8"	7"	Both	167.55		3.70		10.55		17.60			
8"	9"	Both	172.65		3.70		10.55		17.60			
8"	13"	Both	182.85		3.70		10.55		17.60			

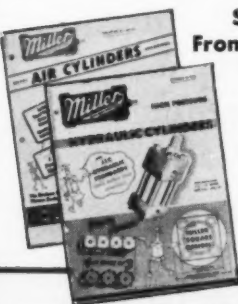
Miller "Stock" Cylinders fully meet the J.I.C. Standards and are identical to Miller "Custom-Built" Cylinders in design and construction.

"Stock" Air Cylinders are for 200 psi operation, "stock" hydraulic cylinders for 2000-3000 psi operation. Piston Rods of "Stock" Cylinders are "Style No. 2 Standard."

For complete descriptive and dimensional data on both "Stock" and "Custom-Built" Miller Cylinders, write for Bulletins A-105 and H-104 sent FREE on request.

**Sales and Service
From Coast to Coast!**

Consult your local
directory or write us
direct for the name
of our representative
for your area



Complete Miller "custom-built" line includes: air cylinders, 1 1/2" to 20" bores, 200 psi operation; low pressure hydraulic cylinders, 1 1/2" to 6" bores for 500 psi operation, 8" to 14" bores for 250 psi operation; high pressure hydraulic cylinders, 1 1/2" to 12" bores, 2000-3000 psi operation. All mounting styles available. Also, a complete line of Fluid Pressure Boosters and Accumulators.

MILLER FLUID POWER CO.

(Formerly MILLER MOTOR COMPANY)



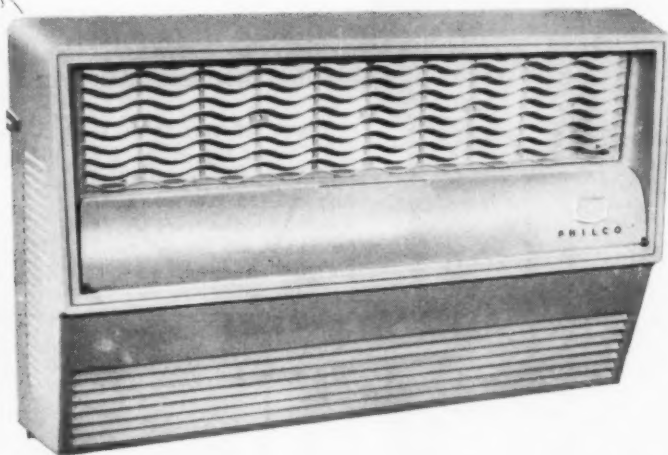
2020 N. Hawthorne Ave. Melrose Park, Illinois

AIR & HYDRAULIC CYLINDERS • BOOSTERS • ACCUMULATORS
COUNTERBALANCE CYLINDERS



*-something **NEW**
in the air!*

**NEW 1954
PHILCO
Air Conditioners**



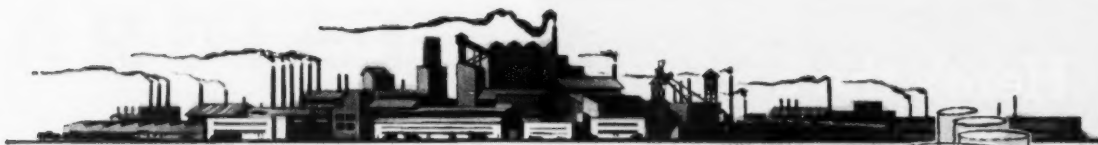
**BRIDGEPORT MOLDS THE GRILLES FOR
THE ULTIMATE IN AIR CONDITIONING UNITS
FROM AMAZING NEW LARGE CAPACITY MOLDS . . .**

Philco leads the field again! One reason? The ability of BRIDGEPORT to create the functionally smart new polystyrene grilles from new-type large capacity molds. It takes constant improvements in facilities and methods to keep ahead of competition today.

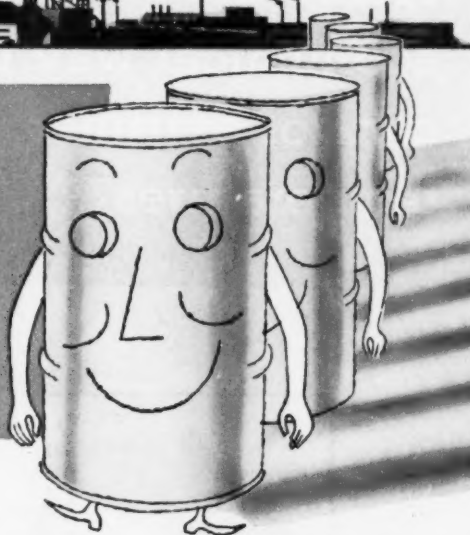
Another example of BRIDGEPORT'S ability to meet the challenges of progress. Another example of successful teamwork between the customer, moldmaker, and BRIDGEPORT.



BRIDGEPORT MOULDED PRODUCTS, INC.
Box 3276, Barnum Station • Bridgeport, Conn.



Rheem Drums are built of Cleaner Steel for Longer Life!



6-STEP PREPARATION—

BEFORE FABRICATION—MEANS SAVINGS FOR SHIPPERS!

1



Shot-blasting process removes troublesome oxide scale from both sides of the steel sheet and leaves a clean, oxide-free surface.

2



The sheet is rolled and leveled to insure a smooth even surface necessary for precision roller coating.

3



Detergents, scalding water and revolving brushes scrub each sheet clean, followed by rinsing and drying.

4



The sheet is treated on both sides with a special patented phosphoric compound to inhibit rusting, enabling Rheem Drums to withstand long periods of weathering.

5



Special coatings, where required, are roller-coated under precision control that eliminates rust-producing thin spots.

6



Coatings are baked-on to produce a tough, durable finish that protects your product from contamination.

IMPORTANT TO SHIPPERS!

Rheem has a complete line of special drum linings for a variety of products. And if your product requires a different lining, each of Rheem's seven strategically-located container plants has complete laboratory facilities to help you. Rheem chemical engineers have solved container problems for many of America's largest shippers. Call or wire the office nearest you!



Free Folder

Write today to the nearest Rheem Manufacturing Office listed below for your free copy of informative folder on Rheem Drums.



RESULT OF RHEEM CARE After more than a year and a half of continuous outdoor exposure, in an area of heavy rainfall and high humidity, Rheem drums are still in excellent condition ... while ordinary spray-finished drums on test for the same length of time show signs of advanced deterioration.



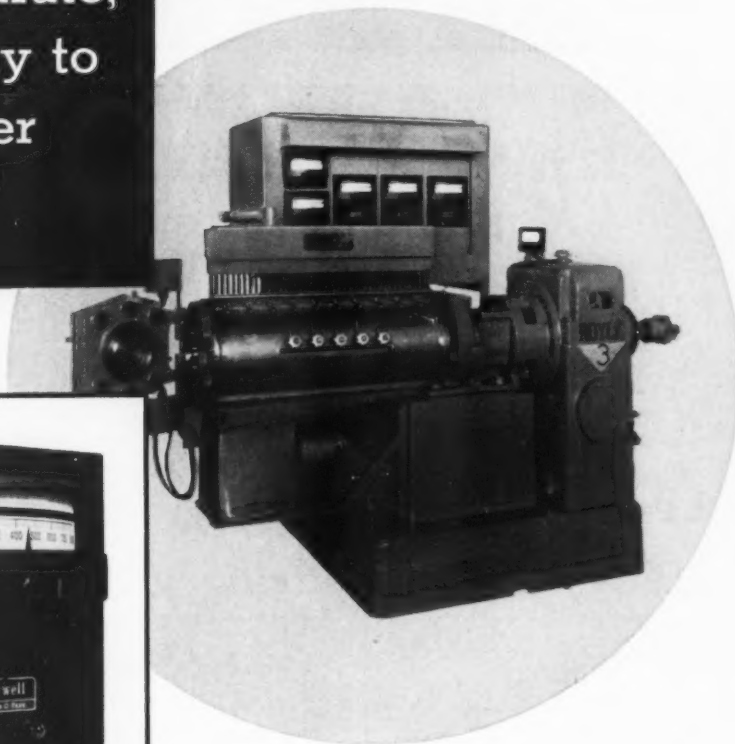
MANUFACTURING COMPANY

World's Largest Manufacturer of Steel Shipping Containers

Richmond, California • South Gate, California • Houston, Texas • Chicago, Illinois
New Orleans, Louisiana • Linden, New Jersey • Sparrows Point, Maryland

Here's the accurate,
economical way to
control extruder
temperatures

Five heating zones of Royle "Spirod" plastic extruder are controlled by *Pyr-O-Vane* instruments on integrally-mounted panel.



... the *Pyr-O-Vane* Controller

EXTRUDER temperatures stay within tight tolerances, when *Pyr-O-Vane* controllers are on the job. In the "Spirod" extruder manufactured by John Royle and Sons, for example, five of these instruments work together in a multi-zone control system that gives excellent accuracy and reproducibility of machine temperatures.

Pyr-O-Vane controllers provide all the accuracy any plastic-working machine could require. Their high resistance measuring system is practically unaffected by length of lead wires. The snap-action control gives razor-sharp sensitivity . . . and incorporates a special anticipator circuit that minimizes cycling above or below the set point. For applications requiring proportional control,

Electr-O-Pulse control is supplied.

Maintenance men appreciate the simple plug-in design of this controller. The complete system can be removed and replaced in only a few seconds. And the instrument's moderate price places high-quality control within the reach of any application. The *Pyr-O-Vane* controller is readily applicable to extruders, injection molders and plastic-working machines of all types.

Your nearby Honeywell sales engineer will be glad to discuss your specific control applications . . . and he's as near as your phone.

MINNEAPOLIS-HONEYWELL REGULATOR CO., *Industrial Division*, Wayne and Windrim Avenues, Philadelphia 44, Pa.

● REFERENCE DATA: Write for Catalog 1053, "*Pyr-O-Vane* Controllers."

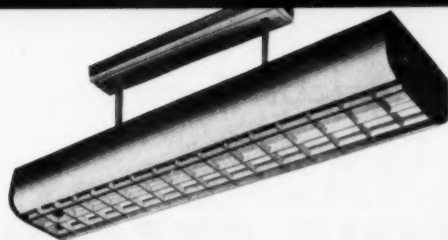


MINNEAPOLIS
Honeywell
BROWN INSTRUMENTS

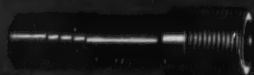
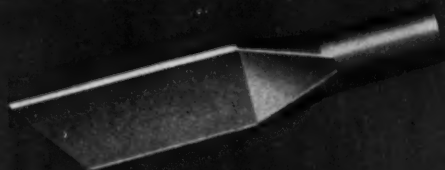
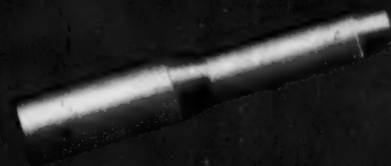
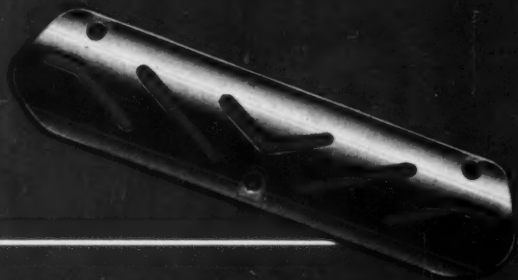
First in Controls

Modern Plastics

YARDLEY



for Quality **EXTRUSION .. INJECTION .. FABRICATION**



GASKETS for

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Storm Windows
Dry Glazing

EDGING for

Linoleum
Glass
Tables
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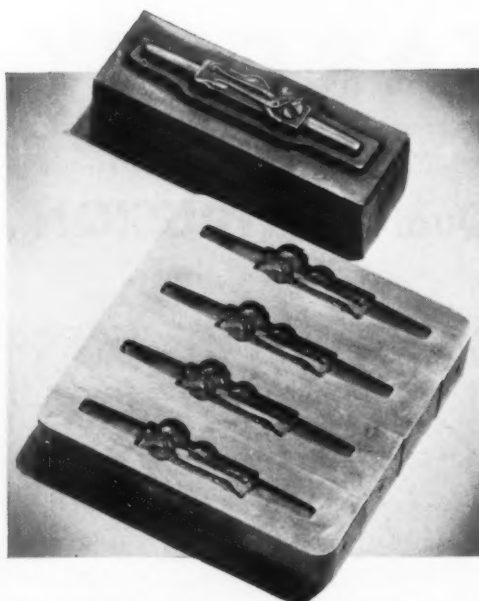
THERE IS AN EXPERIENCED YARDLEY REPRESENTATIVE NEAR YOU. SEND US YOUR PROBLEM

Check the telephone Yellow Pages under PLASTIC, PIPE for local representatives.

YARDLEY PLASTICS CO.
142 PARSONS AVE., COLUMBUS 15, O.
In Canada: DAYMOND CO., LTD., Chatham, Ont.



3 FINE STEELS for COLD-HOBGING



This hobbled die, used in casting necktie clasps, is a representative application for Duramold B hobbing steel.

Duramold

To meet the cold-hobbing needs of the plastic industry, Bethlehem offers three fine tool steels—Duramold A, Duramold B, and Duramold C. Each of these steels has characteristics which mean economical service in hobbing applications. Each steel is also particularly clean, free from surface defects, and capable of taking a mirror-like finish. For full information on these cold-hobbing steels, or on Bethlehem tool steels for machined cavities and master hobs, write to the nearest Bethlehem sales office, or get in touch with your tool-steel distributor.

**BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.**

*On the Pacific Coast Bethlehem products are sold by
Bethlehem Pacific Coast Steel Corporation. Export
Distributor: Bethlehem Steel Export Corporation*

A

DURAMOLD A—Can be hobbled easily because it is annealed to a softness of Brinell 109 max. Air-hardening, with high core-hardness, and minimum size-change in heat-treatment.

B

DURAMOLD B—One of the easiest steels to hob. Hobs almost as easily as Duramold C. Boron added for high core strength. Responds readily to heat-treatment, which produces a surface case of Rockwell C-65, and a core hardness of Rockwell C-15. Oil-hardening.

C

DURAMOLD C—A very soft steel, this cold-hobbing grade is easier to hob than either Duramold A or B because it is annealed to 90 Brinell max. Water-hardening.

CHARACTERISTICS

	Hobability	Machinability	Core-Strength	Wear-Resistance	Distortion in Hardening	Pressure and Temperature
DURAMOLD A (air-hardening)	†FAIR	*FAIR	BEST	GOOD	BEST	Medium to High
DURAMOLD B (oil-hardening)	GOOD	FAIR	GOOD	GOOD	GOOD	Low to Medium
DURAMOLD C (water-hardening)	BEST	FAIR	FAIR	GOOD	FAIR	Low to Medium

†Good, when annealed for machining.

*Best, when annealed for machining.

BETHLEHEM TOOL STEELS



Modern Plastics

for superior light fastness and flushability

HELIOGEN® PRESSCAKES

phthalocyanine blues and greens of exceptional brilliance and workability

Clear, clean, brilliant HELIOGEN Colors are the finest nonfading blues and greens available today... always in demand where quality comes first.

Heliogen Blue

BDV

Presscake

Dark, transparent
mass tones

Crystallizing type

No surfactants

Nonbleeding

24% dry content
(approx.)

Heliogen Blue

BNC

Presscake Special

Stable
dimensionally

Noncrystallizing

No surfactants

Slight bleeding

25% dry content
(approx.)

Heliogen Blue

BG

Presscake Special

Peacock blue shade

Noncrystallizing

No surfactants

Nonbleeding
Heat resistant

40% dry content
(approx.)

Heliogen Green

GB

Presscake Special

Bluer shade,
with added strength

Noncrystallizing

No surfactants

Nonbleeding

29% dry content
(approx.)

FOR FLUSHING IN:

Oil base paints
Plastics
Printing inks
Varnishes
Textile printing

Plastics
Printing inks
Varnishes
Textile printing
Rubber base paints

Oil base paints
Plastics
Printing inks
Varnishes
Textile printing
Rubber base paints
Baking enamels
Enamels

Oil base paints
Plastics
Printing inks
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Textile printing
Rubber base paints
Baking enamels
Enamels

For more complete information on HELIOGEN colors, send for our handsome free booklet.



From Research to Reality

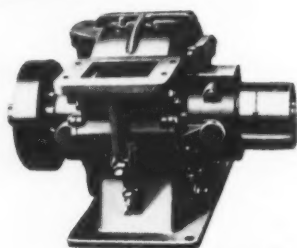
GENERAL DYESTUFF CORPORATION

A SALES DIVISION OF GENERAL ANILINE & FILM CORPORATION

435 HUDSON STREET • NEW YORK 14, NEW YORK

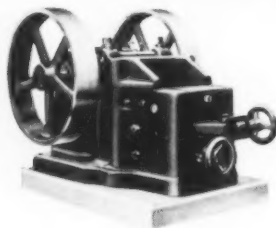
BOSTON • CHARLOTTE • CHATTANOOGA • CHICAGO • NEW YORK • PHILADELPHIA • PORTLAND, ORE. • PROVIDENCE • SAN FRANCISCO

STURTEVANT



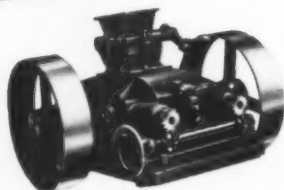
LABORATORY SWING-SLEDGE MILLS

Capable of reducing soft, moderately hard and tough or fibrous materials to any degree of fineness between 1 in. and 20 mesh. The patented "Open-Door" feature permits ready accessibility for cleaning.



LABORATORY JAW CRUSHERS

Special Roll Jaw action simplifies close regulation of the product with capacities varying from 300 to 400 lbs. per hour at finest settings, to 1000 or 2000 lbs. when opened for coarser work. Each part of the crusher is accessible for quick and easy cleaning.



LABORATORY CRUSHING ROLLS

First designed especially for laboratory sampling work, Sturtevant Crushing Rolls are used regularly in many plants where there are limited outputs. Range of output for the 8 x 5 size is from 1/2 in. to 20 mesh — and for the 12 x 12 size from 3/4 in. to 20 mesh.

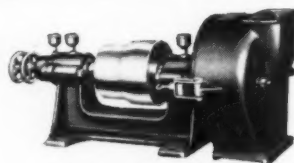
Laboratory Equipment...

assures accurate samples... cuts laboratory sampling costs

Sturtevant laboratory equipment have all the features of full-sized production machines with extra accuracy and wider range of adjustment built-in. They are fast... provide true samples of every batch processed.

All Sturtevant machines have "open-door" accessibility which permits quick, thorough cleaning... prevents the possibility of previous batches from contaminating new samples. Their rugged construction assures round the clock operation with practically no maintenance.

Investigate Sturtevant equipment for your laboratories. They will help you cut sampling costs... improve product quality... increase sales. Write for catalog, today.



LABORATORY SAMPLE GRINDER

Laboratory Sample Grinders are of the "Open-Door" disc type and are capable of very fine work, producing products as fine as 100 mesh (coarser if desired) when working on dry, friable, soft or moderately hard materials. Simply turn hand wheel to provide product regulation from 10 to 100 mesh.

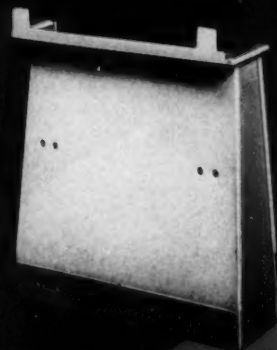
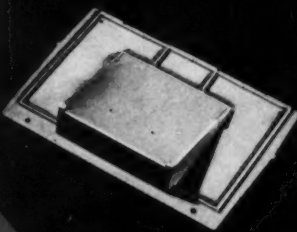
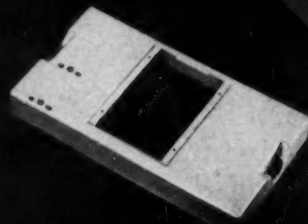
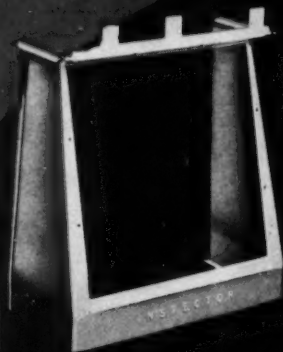
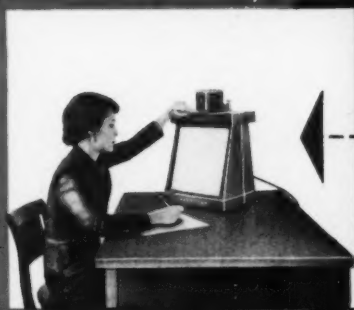
STURTEVANT MILL COMPANY

110 Clayton Street, Boston 22, Mass.

Designers and Manufacturers of

CRUSHERS • GRINDERS • SEPARATORS • CONVEYORS • MECHANICAL DENS and EXCAVATORS • ELEVATORS • MIXERS

Filmsort "Inspector" . . .
Inexpensive portable microfilm
viewer with 11"x11" screen



How a talk with Ideal resulted in

a fundamental product improvement

That Ideal Plastics' service includes "much more than molding" is proven by the new "Inspector" microfilm reader manufactured by Filmsort, Inc., Pearl River, N. Y.

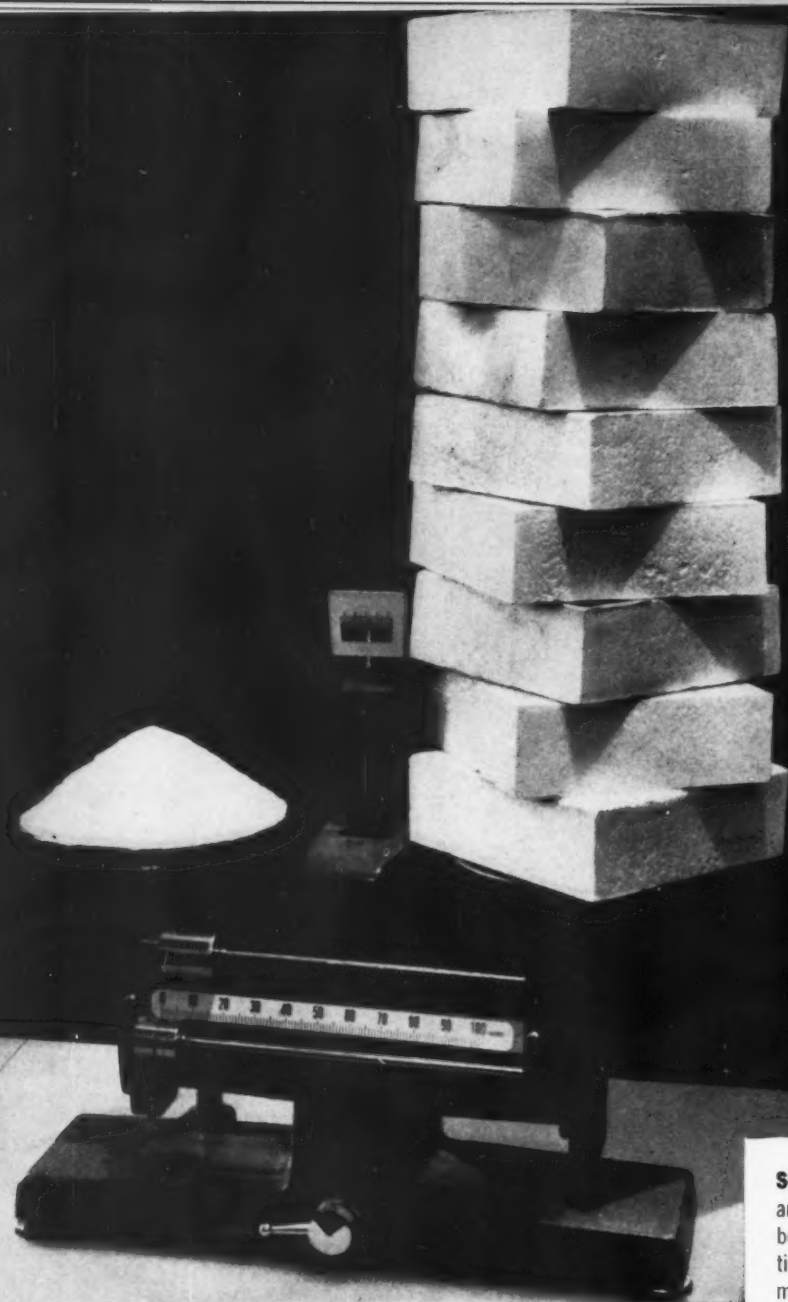
Its predecessor, made of metal, was one of the most popular units of its type. Yet, the Filmsort management, striving for an even better product, asked Ideal to try its hand at redesign.

To replace the expensive-to-fabricate metal housing, Ideal's engineers came up with a handsomely trim, high impact styrene case. Molded-in mountings make assembly as simple and inexpensive as can be. The newly designed lamp housing—of sparkling green nylon—provides high lighting efficiency and easy bulb changing.

All in all, Ideal suggested four high impact styrene and one nylon part. The body housing is molded in two sections, cemented together and attractively hot stamped before shipment. As a result of these improved components—suggested and custom injection molded by Ideal—Filmsort's manufacturing costs are now lower, and their product is better than ever.

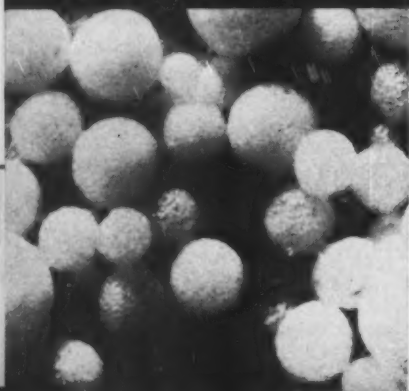
This case history has significance for you. Regardless of what material your product is currently made of, chances are Ideal's engineers can point out new avenues for improving it or molding it at lower cost. For full details contact A. C. Manovill, Vice President in Charge of Sales, Ideal Plastics Corporation, 184-10 Jamaica Ave., Hollis 7, New York. Phone AXtel 7-7000.

Better Molded Plastics **Ideal** *for Industry & Home*

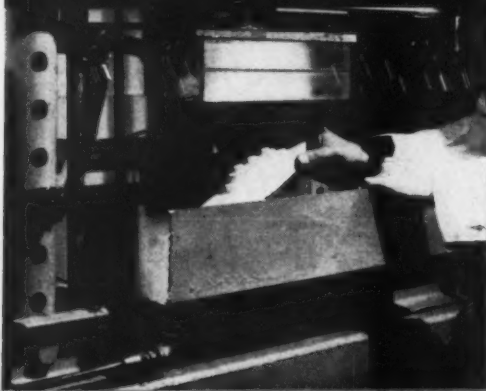


SO MUCH FROM SO LITTLE. Before and after expansion—this small pile of beads has been blown up to about 30 times its original size. The weight remains the same.

SEE THOSE BEADS. This picture shows the magnified plastic beads that expand to form a variety of shapes and sizes.



POP GOES THE POLYSTYRENE. A simple molding machine, Koppers Expandable Polystyrene and a little heat are all that is needed to make any shape you need. The smooth, white surface of the foam does not require finishing.



PLAIN OR FANCY. Expandable polystyrene rises to fill intricate molds. Molded pieces can be painted if desired.



Amazing new Polystyrene can be expanded to shape

Koppers Expandable Polystyrene makes tough foam that insulates, floats

NEW Koppers Expandable Polystyrene looks like granulated sugar. But, when a handful of it is poured into a simple mold and heated, the polystyrene rises to fill the entire cavity. It forms millions of small plastic cells, all joined together to make a tough, strong foam. Open the mold and you have a foamed polystyrene piece, smooth and light and in the shape and density desired.

By controlling the *quantity* of polystyrene placed in the mold, the density and physical properties of the expanded plastic may be varied as desired. The heavier material is stronger because it has a tighter network of small, thick walled plastic cells. Lightweight products have larger cells, and

a higher insulating value.

Koppers Expandable Polystyrene can be molded into a variety of shapes for low temperature insulation — refrigerators, freezers, air conditioners and piping. Also, this new polystyrene is just the thing for life rafts, buoys, packaging, toys and displays. Use it in

products needing light weight, insulating properties, buoyancy, strength, smoothness, paintable surfaces, low water absorption, and precisely molded contours.

For more information about Koppers Expandable Polystyrene, fill out and mail the attached coupon.

**Be sure to see
this new
Polystyrene
at the Plastics
Show—
CLEVELAND, OHIO,
JUNE 7 THRU 10.**

Koppers Company, Inc.
Dept. MP-64, Chemical Division
Pittsburgh 19, Pennsylvania

Please send me further information on Koppers
Expandable Polystyrene ☐

Name.....

Address.....

City.....State.....



Koppers Plastics Make Many Products Better and Many Better Products Possible

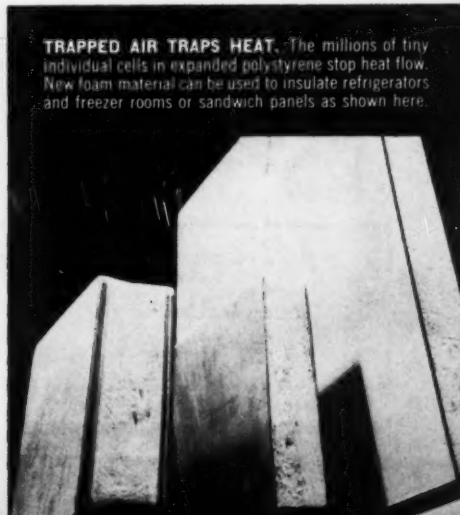
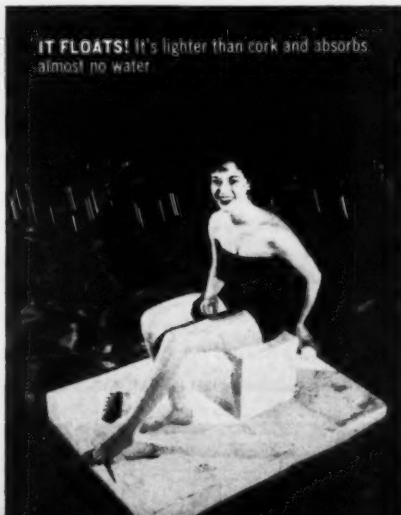
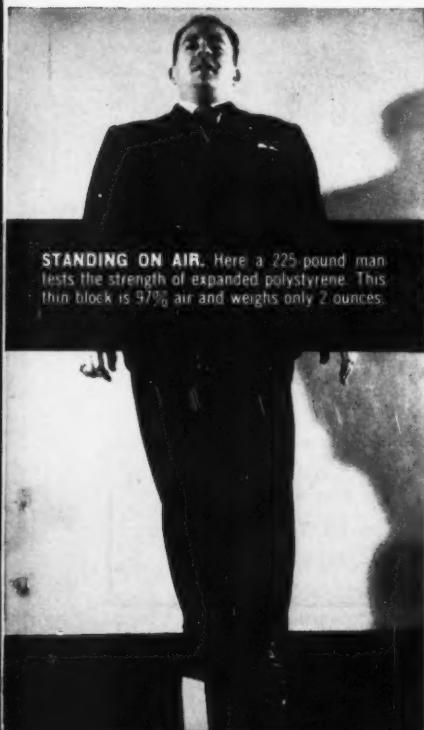
Koppers Plastics

KOPPERS COMPANY, INC., Chemical Division, Dept. MP-64, Pittsburgh 19, Pennsylvania
SALES OFFICES: NEW YORK • BOSTON • PHILADELPHIA • ATLANTA • CHICAGO • DETROIT • LOS ANGELES

STANDING ON AIR. Here a 225-pound man tests the strength of expanded polystyrene. This thin block is 97% air and weighs only 2 ounces.

IT FLOATS! It's lighter than cork and absorbs almost no water.

TRAPPED AIR TRAPS HEAT. The millions of tiny individual cells in expanded polystyrene stop heat flow. New foam material can be used to insulate refrigerators and freezer rooms or sandwich panels as shown here.



Announcing the Sensational New **AUTOMATIC SPRAY DECORATING MACHINE**

which, with no interruption of continuous painting production, automatically washes masks right in the machine and returns them to painting position clean and dry.

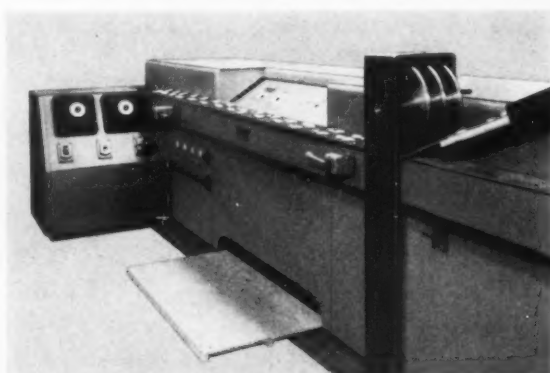
No other machine ever required so few masks—only four per operator. Permits tremendous savings in mask investment.

Simultaneously paints two colors on one part or one color on two parts.

Capacity of up to 3,600 pieces per hour, depending upon handling facilities and decoration applied.

Fully adjustable as to amount of paint applied, number of coats and speed of operation. Clean, filtered air is induced for exhausting purposes, and foreign matter is kept from the spray area.

Complete details on this new development can be had at our exhibit booths 308-310 at the National Plastics Exposition in Cleveland, June 7-10. Engineers will be in attendance for the solving of your decorating problems. See the big display of spray masking and decorating equipment.



Installation for large toy manufacturer. Work flows continuously and directly from the molding machine to the painting operation, and thence by conveyor to assembly.

CONFORMING MATRIX CORPORATION

364 Factories Building

West Coast Office: 38 LaPorte St., Arcadia, California
Phone Douglas 6-2906

Toledo 2, Ohio



X-ray-"Private-eye" of quality control...

You are looking at the beginning of a quality control step that used to take over four hours—now it's done in six minutes! A specimen of Glidden Rutile Titanium Dioxide is being readied for exposure to 4 X-ray beams in the Diffractometer. The "magic eye" of this unit will determine the degree of rutilization in the pigment, then amplify, count and record the data. It's all part of the extra care that Glidden takes to assure you the highest quality pigments—Rutile and Anatase Titanium and Cadmolith Reds and Yellows. Ask now for detailed information on these products of Glidden Planned Research.

THE GLIDDEN COMPANY
Chemicals • Pigments • Metals Division

Baltimore, Maryland • Collinsville, Illinois • Oakland, California • Hammond, Indiana • Scranton, Pa.



why you should consider...

Du Pont 50% FORMALDEHYDE

- ▶ **It's a high strength formaldehyde that costs no more—on a formaldehyde content basis—than lower strength grades.**
- ▶ **It increases kettle capacity—reduces production cycles and cuts labor costs.**
- ▶ **It saves time, vacuum, power and steam—because there's less water to remove from finished resin.**

IF YOU manufacture liquid adhesives or solid resins you should investigate these and other advantages of 50% formaldehyde.

Manufacturers throughout the plastic industry have been successfully using Du Pont's high strength formaldehyde for several years. In some cases, they were able to cut production cycles 50% or more while saving time, vacuum, power and steam. You may be able to do the same.

Du Pont will be glad to give you full information about 50% formaldehyde and how it can be easily and safely handled in bulk quantities. Just call our nearest District Office or write to: E. I. du Pont de Nemours & Co. (Inc.), Electrochemicals Department, Wilmington 98, Delaware.

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For prompt information or service, contact your nearest Du Pont District Office.

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| • Du Pont 50% (by weight) formaldehyde L.M. (low methanol) | —Available only in tank trucks or tank cars. |
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Du Pont formaldehyde has been satisfying industry's most demanding requirements for over 50 years. All solutions are produced under carefully controlled conditions that assure uniformity and high quality in every shipment.



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. . . with Fidelity's method of **HOSE** reinforcement

You can knit natural and synthetic yarns at speeds up to 1,000 feet per hour on rubber and plastic extrusions in continuous lengths. Hose is strong and *flexible*, adhesion is better, diameters are uniform.

By eliminating costly rewinding, treating and drying operations, electrically controlled Fidelity Hose Reinforcement Machines are setting new economy records in plants where they replace conventional braiders. These machines have been time tested by the world's leading Rubber Hose Manufacturers for nearly 20 years.

Write today for Catalog HR describing advantages and technical details. When in the Philadelphia area, visit the new showroom at our plant and see the Fidelity Hose Reinforcement Machine in operation.



Designers and Builders of Intricate, Automatic Precision Machines

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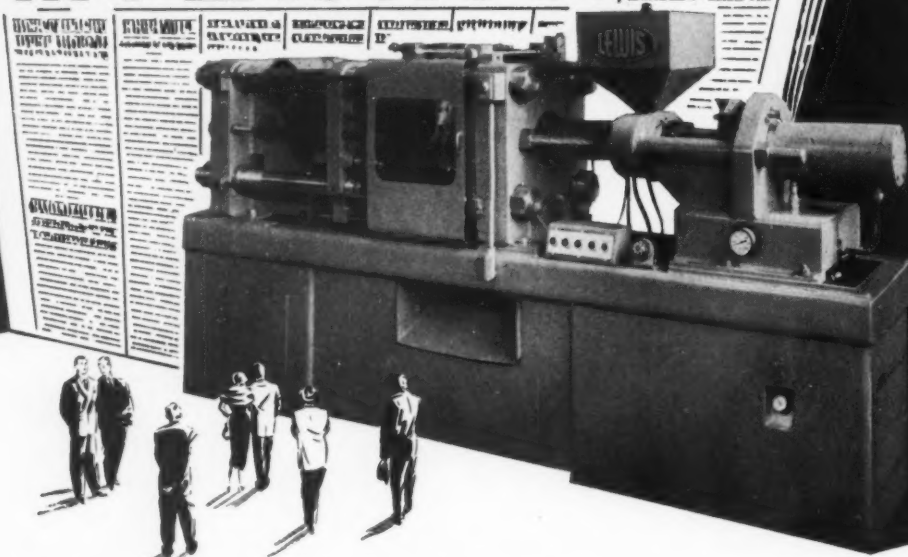
W. J. Westaway Co., Ltd., Hamilton, Ontario, Canada.

June • 1954

61

FOCUS

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The LEWIS "6" Injection Molding Machine

HERE'S WHY:

INCREASED CAPACITY . . . The Model "6" will plasticize up to 60 pounds of material per hour . . . mold 7-ounce shots of polystyrene at the rate of 2½ per minute.

NEW CLAMPING MECHANISM . . . The exclusive LEWIS "HYDRA-LOCK", the most powerful mold clamp available, develops a 200-ton clamping pressure in tenths of a second.

ASSURED ECONOMY . . . Intricate parts formerly made on much larger machines can now be produced by the Model "6" at a fraction of initial and normal operating cost.

MAXIMUM SAFETY . . . Mold clamping device features over-center toggle mechanism . . . safety interlocks on gate . . . and emergency stop for positive safety.

In addition, injection pressures up to 15,000 psi . . . a compensating feed mechanism . . . automatic molding cycle . . . large platens . . . fingertip controls . . . and minimum maintenance combine to make the biggest news in plastics . . . THE LEWIS "6" INJECTION MOLDING MACHINE.

Write today for Bulletin 102.



THE LEWIS WELDING AND ENGINEERING CORPORATION
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with **adp's** new 20% black dispersion

2 to 3% concentration of thoroughly dispersed carbon black is now accepted as the most effective way of protecting polyethylene pipe from embrittlement in sunlight, and prolonging its life as much as 20 times.

Now **adp** offers plastic pipe manufacturers a time- and money-saving black dispersion which reduces to 3% concentration and forms the finished pipe in one pass through the extruder. The new dispersion, **adp 9PE398**, contains a 20% concentration of a high grade channel black, which gives the desired degree of protection with economy.

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We'll be glad to have one of our engineers discuss your problems with you without cost or obligation. This may save you time and money.

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Write, wire or phone today for our new booklet containing descriptions of **SELECTRON** Resins and explaining many of the ways in which they can be used. Pittsburgh Plate Glass Company, Selectron Products Division, Gateway Center, Pittsburgh, Pa.

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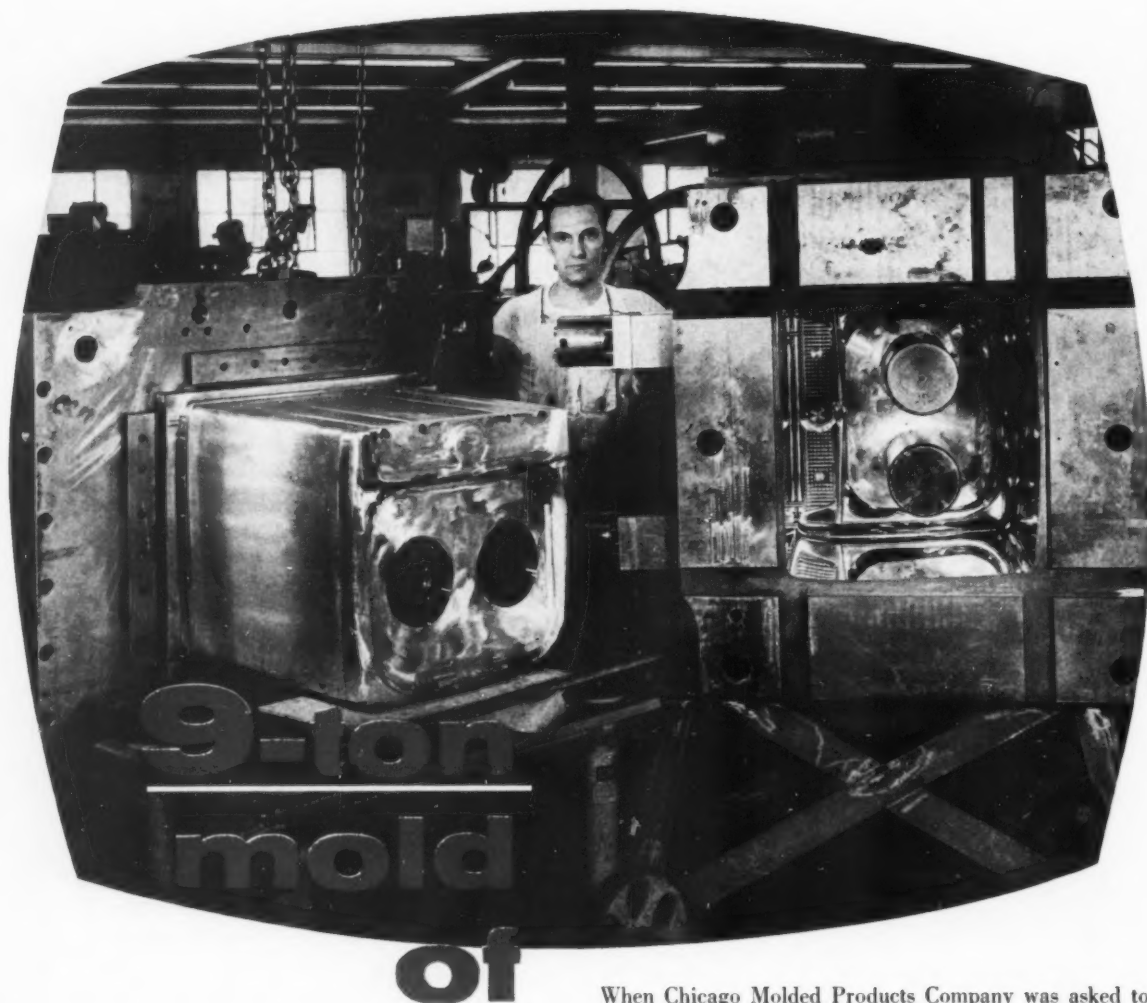


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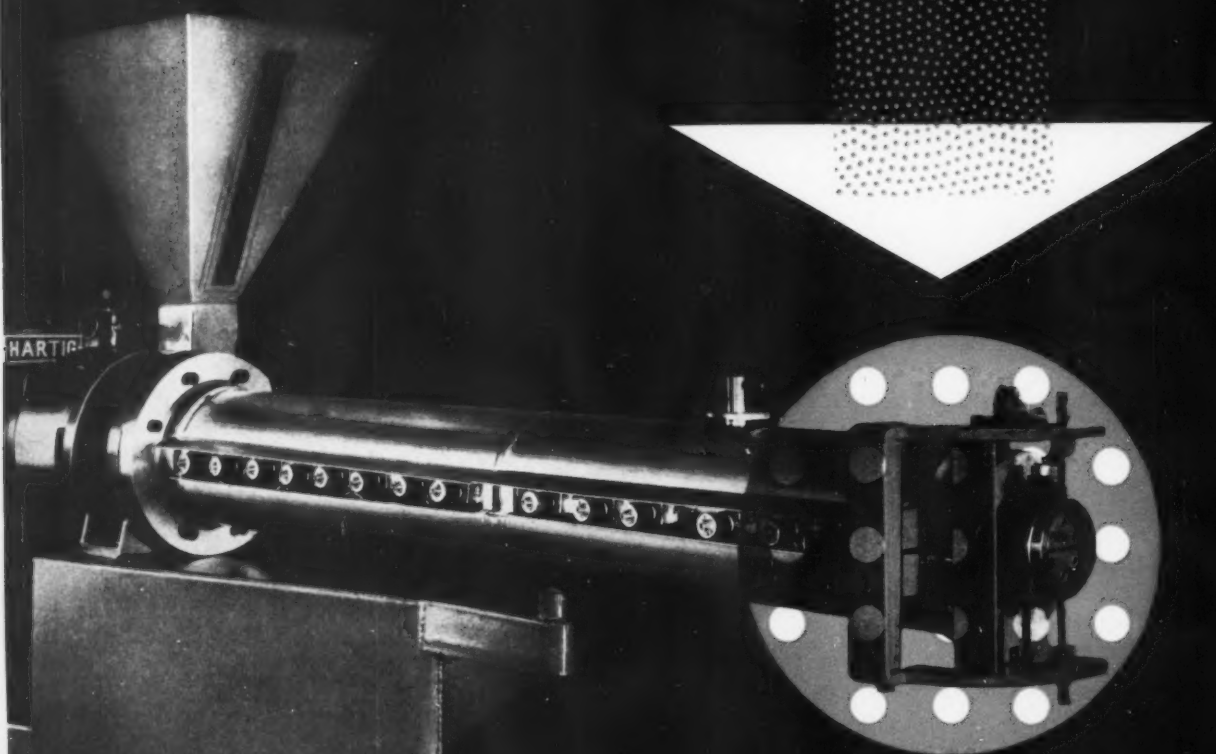
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D.I.O.P. SCORES A HIT

More and more vinyl processors are employing di-iso-octyl phthalate as an economical and efficient plasticizer for film, sheeting, and other plastics applications.

This trend is evident in the increasing diversity of vinyl plastic products formulated with D. I. O. P. For example, plastisols made with D. I. O. P. exhibit low stable viscosities. Vinyl insulations incorporating this plasticizer possess good electrical properties. Film and sheeting plasticized with D. I. O. P. have excellent stability to heat and light.

Hercoflex 200 is Hercules' D. I. O. P. We believe you will find it a superior grade—pale in color, low in volatility, and uniform in quality, properties, and performance. It carries the Hercoflex name, backed by the years of technical and manufacturing know-how that have established this line of vinyl plasticizers.

Hercoflex 200 is readily available, and priced for today's market. We welcome your inquiries on price and delivery data, or for further technical information.



HERCOFLEX[®]
VINYL PLASTICIZERS

150	(di-N-octyl, decyl phthalate)
200	(di-iso-octyl phthalate)
290	(di-N-octyl, decyl adipate)



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FORMVAC

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Hydro-Chemie, Ltd.
will be present at
the National
Plastics Exposition

NEW AUTOMATIC VACUUM DEEP DRAWING AND FORMING MACHINE molds both rigid and flexible sheet thermoplastics

The new "Formvac" revolutionizes the economics and product quality of vacuum forming. Fully mechanized, foolproof operation slashes costs of large or small articles deep-drawn from either rigid or flexible thermoplastic sheet. Swiss precision engineering and robust construction assure perfect product quality and no maintenance problems.

- Automatic, foolproof operation
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- Attractively priced
- Early delivery

"Formvac" Standard Model AA, twin-table design. Molding area 24 x 36" per platen, with up to 14" depth of draw. Models having other dimensions are under development.

For descriptive folder please write manufacturers:

Plastics Development Division

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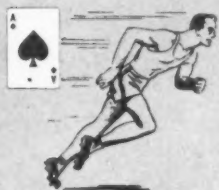
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MODEL 6002 — The mobile temperature control unit functioning in leading plastics plants from coast to coast. Ready to operate when connected to electricity, water, and drain.



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Small total water capacity eliminates excessive thermal carryover either way.



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MODEL 6003 — A compact unit designed for permanent installations. (Can be equipped with casters). Requires approximately 50% less floor space than Model 6002 with same capacities.

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Condensation and Vacuum Pumps



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Temperature Controls



L·O·F Garan roving gives required high strength reinforcement in this 5-foot gas cylinder made by Taylor-Wharton Iron & Steel Company. These Fiber-Glass reinforced plastic cylinders have a burst strength between 7000 and 9000 pounds per square inch gauge pressure, and reflect a 30% weight reduction over steel.

Greater Wet Strength means L·O·F *Garanized* Fiber-Glass

—an excellent treatment for roving, even-tension roving, mat, chopped strand, cloth and woven roving mat

Product preference is one of the best possible guides to a better product. An instance of this is the insistence of so many manufacturers upon L·O·F Garanized Fiber-Glass reinforcements.

Their repeated specification of Garanized Fiber-Glass is positive recognition of the greater wet strength it gives to reinforced plastics.

Libbey-Owens-Ford's famous Garan treatment

bonds Fiber-Glass reinforcements more strongly—both chemically and mechanically—to the molding resin. This stronger bond means not only greater wet strength, but greater dry strength, as well. Moreover, Garanized Fiber-Glass now costs no more than chrome roving.

In bringing you Garan treatments, L·O·F also makes available to you helpful technical counsel. Get in touch with your nearest L·O·F office (offices in 26 major cities). Or write: Libbey-Owens-Ford Glass Company, Fiber-Glass Division, 15-64 Wayne Building, Toledo 3, Ohio.



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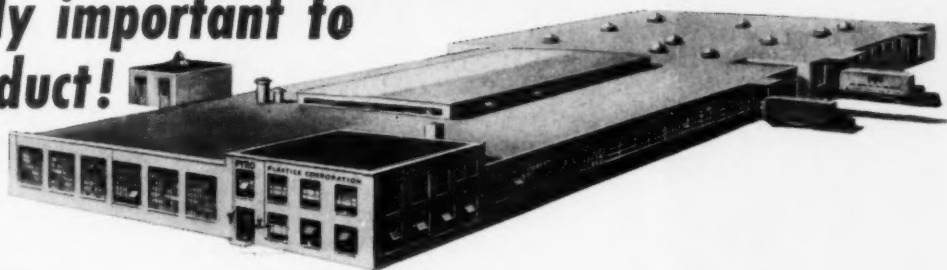
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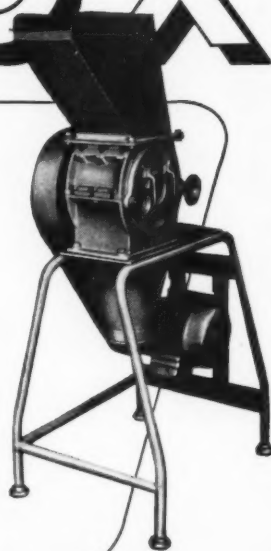
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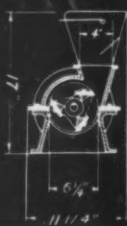
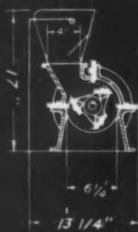
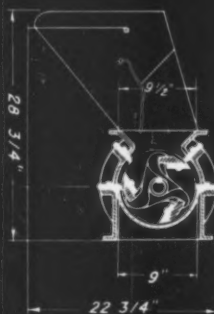
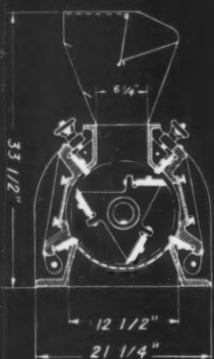


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Write today for Technical Bulletins No. 1, 2, 3, and 5, which describe the use and advantages of each.

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AT LOW COST

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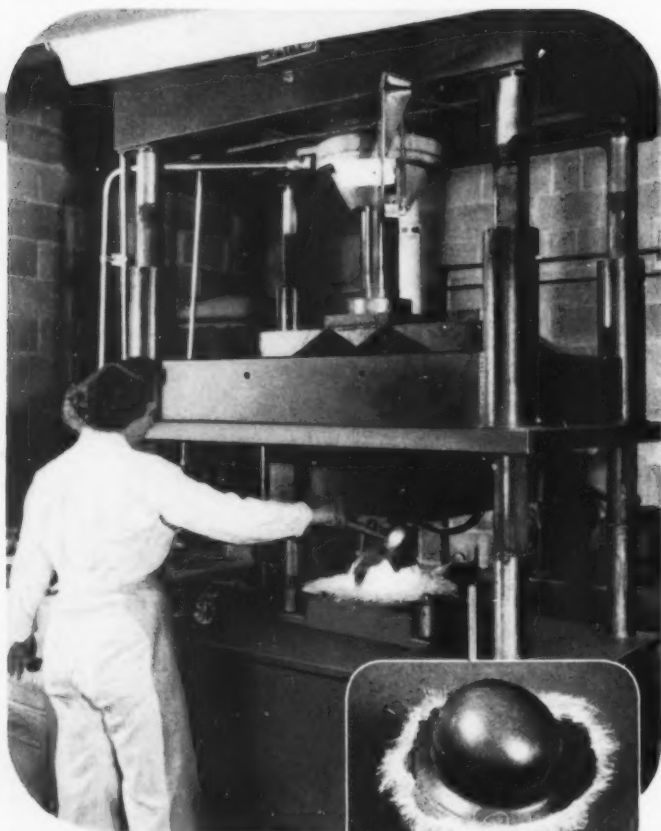
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The quick, easy way to mold reinforced plastics

DAKE PLASTICS PRESSES

Speed output, reduce cost

- Engineered by men experienced in reinforced plastics
- Used for either experimental or production work
- Fully described in Bulletin #273



Molding safety helmets on a Dake Plastics Press — Model 18-187, 25-ton capacity. Production rate is expected to reach 45 to 50 per hour. Welding helmets are also molded on this press.

Close-up of the helmet before flash is removed. Helmets weigh only 12 oz — withstand much more than the 40 ft.-lb required.

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FAST RAM APPROACH speeds closing of movable platen, which slows automatically as work is approached

PRESSURE ADJUSTABLE from half to full press capacity

ELECTRIC TIMER holds pressure during curing cycle—adjustable from 12 sec to 6½ min—after which ram returns automatically

CAPACITIES from 25 to 300 tons

HEATED PLATENS can be provided

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PRESSES**



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Power-Operated Hydraulic



Guided Platen



Gap Type Presses



Movable Frame

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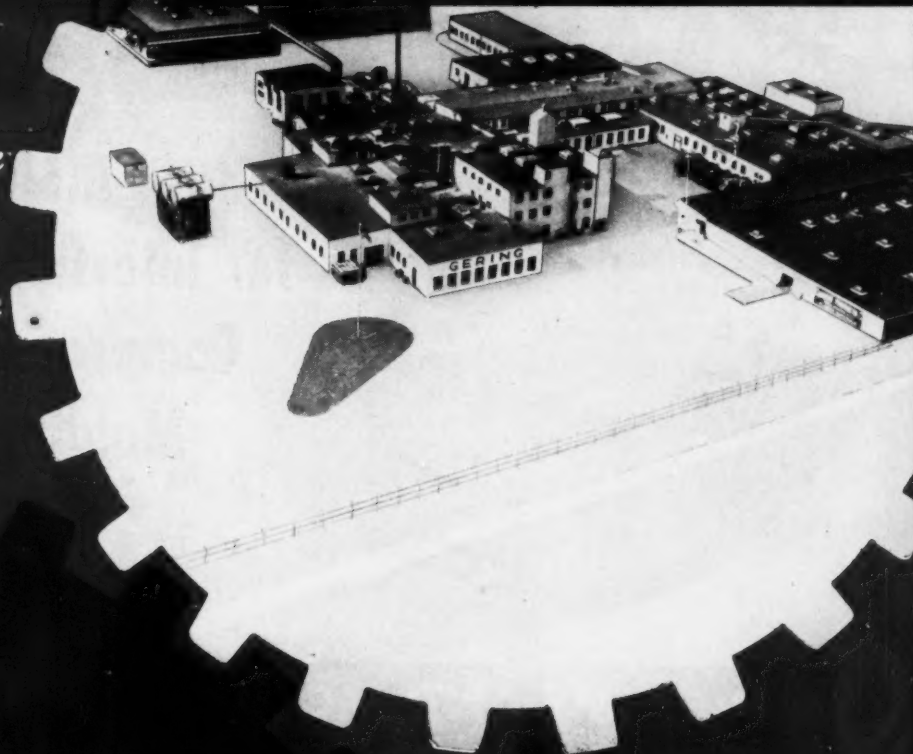
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Virgin Thermoplastic injection and extrusion molding compounds, standard and special formulations...
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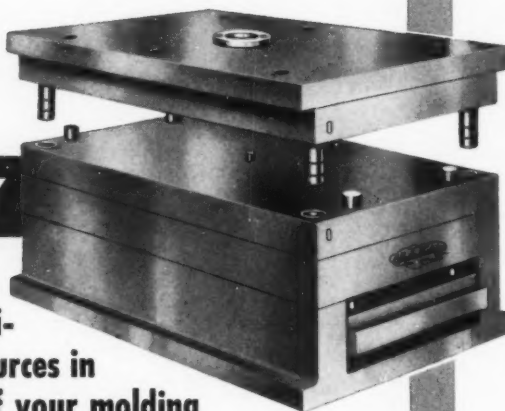
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Catalog D-4, containing 108 pages of engineering data, weights and prices — listings and illustrations of our complete and varied line of Standard and Stripper Mold Sets. Complete engineering information and prices of stock components in great selection are also listed in Catalog D-4. Send in for your copy — we will be pleased to send it.

Featuring a wide size range—applicable to practically any platen. Clamp slot types allow maximum piece part area. Special Mold Sets made to customer specifications —cavity plates also available in "Holliday" speed alloy

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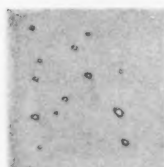
HOW FERRO'S "1203" SOLVES 3 PROBLEMS

for Organosol and Plastisol manufacturers

1. DEAIRATION

To the right are illustrations made from actual test samples of a vinyl-paste resin using three different stabilizers. All samples were treated in exactly the same manner, but the differences are obvious. While air bubbles occurred using both stabilizer A and B, Ferro Stabilizer 1203 produced a sample entirely free of entrapped air.

(Test samples available on request)



STABILIZER "A"



STABILIZER "B"



FERRO STABILIZER
1203

2. VISCOSITY BUILD-UP

As is well known, many stabilizers contribute to viscosity increase of plastisols during storage. In No. 1203, Ferro introduces a sta-

bilizer that not only does *not* contribute to viscosity build-up, but often acts as a viscosity depressant.

3. COPPER STAINING

Slush molders using copper molds are frequently troubled with discoloration due to copper staining. In the test at the right, new copper pennies were fused in the plastisol samples. Both stabilizer A and B showed bad copper staining, while Ferro Stabilizer 1203 produced perfectly colorless samples free of any copper stains.



STABILIZER "A"



STABILIZER "B"



FERRO STABILIZER
1203

DEVELOPED ESPECIALLY FOR PLASTISOLS

Ferro Stabilizer 1203 is the product of two years' intensive research. It is a stabilizer developed *solely* for use in plastisols, to meet specific needs in the field. The tests shown above definitely prove Ferro's 1203 much

superior to competitive stabilizers now on the market.

Write for samples and complete information. Let Ferro's 1203 solve *your* stabilization problems.



FERRO CHEMICAL CORPORATION

A Subsidiary of Ferro Corporation

450 Krick Road • Bedford, Ohio

Another new development using

B. F. Goodrich Chemical raw materials



The pump rod cups are made by The Dragon Manufacturing Company, Marietta, Ohio. B. F. Goodrich Chemical Company supplies only the Hycar rubber.

IT'S HYCAR-PHENOLICS FOR TOUGHER, LONGER LASTING PARTS

HERE'S a combination that can handle the *really tough* jobs—Hycar American rubber and phenolic resins. The oil well pump rod cups pictured above are molded from a Hycar-phenolic blend. They maintain high pump efficiency long after other cups would fail—extend the continuous operation of the pumps by as much as three months. Result—users gain higher well production and lower labor costs.

This outstanding performance is made possible by combining Hycar

with a phenolic resin. The result is a compound with better shock, abrasion and fatigue resistance than ordinary rigid materials. Furthermore, Hycar-phenolics resist the deteriorating effects of oil and many chemicals and, because of their excellent processing characteristics, frequently solve the problem of molding intricate parts.

Hycar, either alone or in combination with other materials, may help you develop products that will stand up under severe conditions.

For technical information, please write Dept. HV-3, B. F. Goodrich Chemical Company, Rose Building, Cleveland 15, Ohio. Cable address: Goodchemco. In Canada: Kitchener, Ontario.

B. F. Goodrich Chemical Company
A Division of The B. F. Goodrich Company

Hycar
Reg. U.S. Pat. Off.
American Rubber

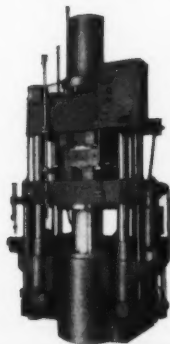
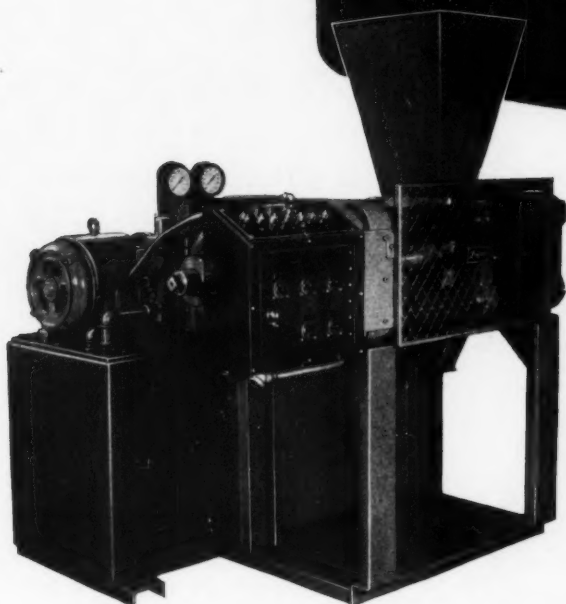
GEON polyvinyl materials • HYCAR American rubber • GOOD-RITE chemicals and plasticizers • HARMON colors

The Logan

ATTENTION PLASTIC MOLDERS

Hydraulic Preformer gives you

operational advantages



LOGAN HYDRAULIC PRESSES ARE THE NEW PACESETTERS FOR INDUSTRY. Logan makes a complete line of hydraulic presses for plastic or rubber molding, laminating, pressing, forming, staking and broaching. Capacity range 20 to 200 tons.



Write for complete data on Logan Hydraulic Preformers and Presses.

1. Preformer is hydraulically operated and is governed by push-button electronic controls. Plug-in relays, long-life cold cathode tubes together with control panel are fully enclosed in a dust proof case. Preformer operates on full automatic cycle with semi-automatic operation available for set-up.

2. Preformer has capacity of 25 square inches of sound preforms per cycle. Dies may have single or multiple cavities.

3. The Logan Hydraulic Preformer has a selective pressure range of 0 to 125 tons on the die. So accurate is the unit that weight of pills or preforms can be controlled with a variance of not more than $\frac{1}{2}$ of 1%. This results in uniformity in preheating and more efficient molding.

4. The unit cannot be damaged by double stroke of preforms—Automatic Motor Stop if preform does not discharge due to lack of material or over-filled tote box.

5. No limit switches to adjust. Record of dial settings on shop card permits accurate, fast set-ups for re-runs.

6. Horizontal design permits gravity discharge, minimizing breakage and damage to preforms.

7. Horizontal design makes possible automatic preforming of impact type materials rapidly and accurately.

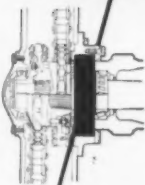
8. Operation is practically dust free. Rods and Guides are fully enclosed.

9. Made by a manufacturer of precision equipment in machine tools and hydraulic presses.

HYDRAULIC DIVISION

LOGAN ENGINEERING CO.
2001 West Lexington Avenue, Chicago 27, Illinois

This rugged motor grader, made by Caterpillar Tractor Co., Peoria, Illinois, features a tandem-swing drive in its rear wheel design which gives it great traction and grade accommodation.



INSUROK

T-602

stands up where metals fail!

Graphited plastic laminate eliminates sleeve trouble in "Caterpillar" Motor Grader

On their Motor Grader tandem-drive housing pivot bearings, Caterpillar Tractor Co. experienced premature sleeve bearing wear. These bearings are subjected to intermittent oscillating motion and are difficult to lubricate. Field reports showed that metal sleeves became scored after only 300 to 600 hours of operation.

Richardson engineers recognized this as an ideal job for INSUROK, Grade T-602. In such difficult bearing applications, this self-lubricated graphitized phenolic laminate provides just the right combination of properties for long, trouble-free service. Result for "Caterpillar": three years of use — no trouble reports!

In hundreds of similar applications, laminated and molded INSUROK made by The Richardson Company are solving difficult problems for industry. Investigate these materials, today.



INSUROK*

Laminated and Molded Plastics

*Reg. U. S. Pat. Off.

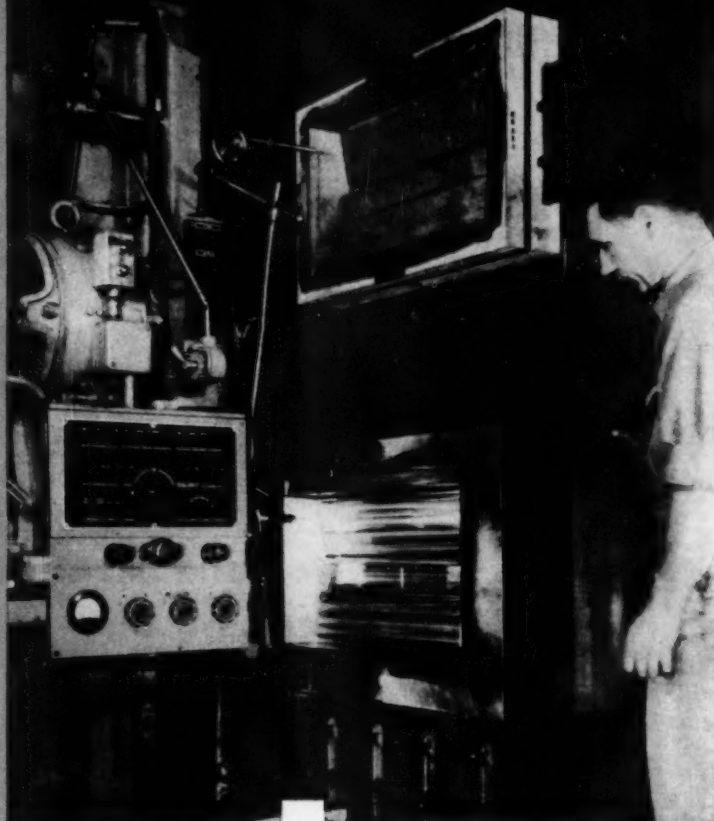
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Selected by
the Newark
Die Company
for this large
plastic mold...



Photograph—courtesy of
Newark Die Company

Cascade

precipitation-hardened die steel

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Sales Agents

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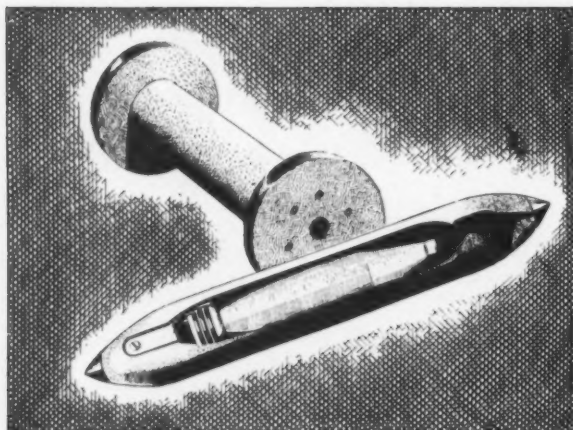
Because of its unique properties, Latrobe's CASCADE precipitation-hardened die steel was selected by Newark Die Co. as the best possible steel for this large mold used to form the handsome grills for Philco Air Conditioning units.

Cascade's outstanding machining and finishing properties together with its high strength and uniform hardness throughout large blocks make it the best choice for prehardened plastic molds.

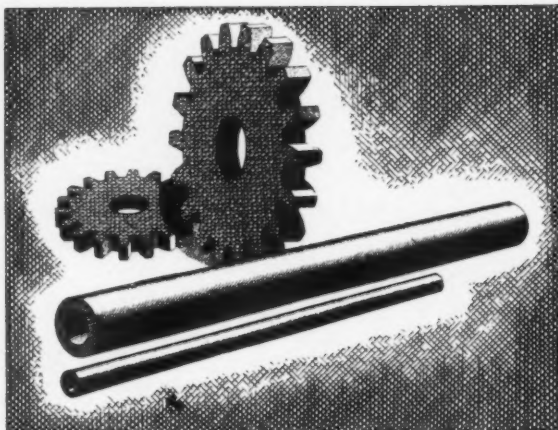
Call your Latrobe representative or write for complete data today!



LATROBE
STEEL COMPANY
LATROBE, PA.



Lantuck non-woven fabric is an economical filler for laminates requiring superior mechanical strength and easy machineability.



Wellington Sears Superior army duck is a heavy, rugged fabric with hard-gripping texture—ideal for shock-resistant laminates.

You get superior electrical laminates with **WELLINGTON SEARS** *Spun Nylon Fabric*



If you've been looking for a fabric that will provide laminates with superior insulating qualities under high humidity conditions—Wellington Sears spun nylon fabric is it. The nylon staple fibers in this reinforcement fabric also contribute unusual bonding strength in a large variety of end use applications for the electronic and high frequency fields.

This spun nylon fabric—available in a complete range of widths and weights—is but *one* of the many Wellington Sears fabrics offered to laminators. Whether it's cotton or synthetic . . . woven or non-woven . . . it will pay you to make Wellington Sears your first stop for fabric-and-plastic applications. A call or letter to our nearest office will bring complete information.

Write for a free copy of "Modern Textiles For Industry" which includes pertinent information on fabric-and-plastic applications. Address: Wellington Sears, Department J-5, 65 Worth Street, New York 13, New York.

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Sing'a filling ducks	Broken twills
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Sateens	Lantuck non-woven fabrics
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®DuPont's trademark for its acrylic fiber

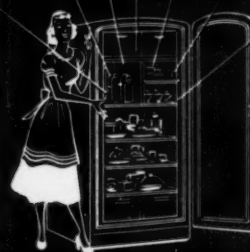
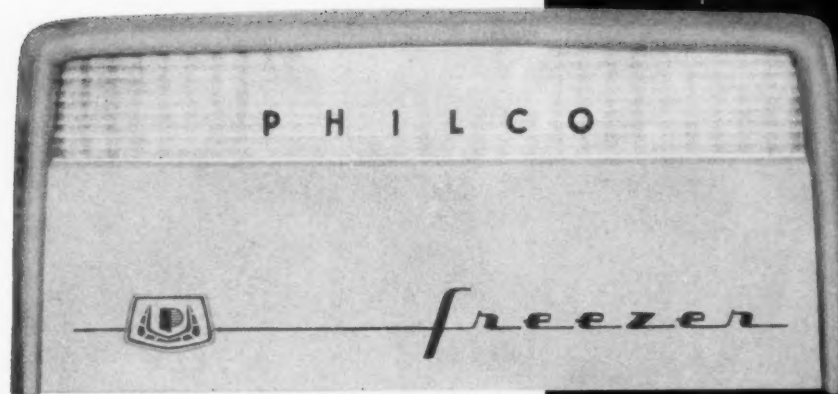
Wellington Sears

A SUBSIDIARY OF WEST POINT MANUFACTURING COMPANY

FIRST In Fabrics For Industry

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Doors that Invite... to Stored Delight



custom
molded
and finished
in

ERIE

Three Dimensional
Plastics

ERIE CUSTOM MOLDED PLASTIC PRODUCTS for:

- Automotive Industry
- Radio and TV Industry
- Electrical Appliance Industry
- Amusement Industry
- Photographic Industry
- Dentist's and Doctor's Equipment
- Three Dimensional Name Plates
- National Defense

The designers for two leading refrigerator manufacturers have made the utilitarian doors to the freeze compartments captivating in their rich and colorful beauty. Philco has framed the rich ivory and white panel in gold with the name and raised crest in crystal, and "freezer" depressed in gold letters. Crosley has used a startlingly attractive two-tone herringbone aqua, offset by an upper white panel edged and lettered in gold.

Both doors were molded by ERIE in crystal clear plastic... all colors applied on the backs and are permanently protected from tarnish or wear.

Erie has the facilities and the know-how to bring your design sketches complete to brilliant reality.

Write for your copy of bulletin, "Who We Are... What We Do in Plastics."



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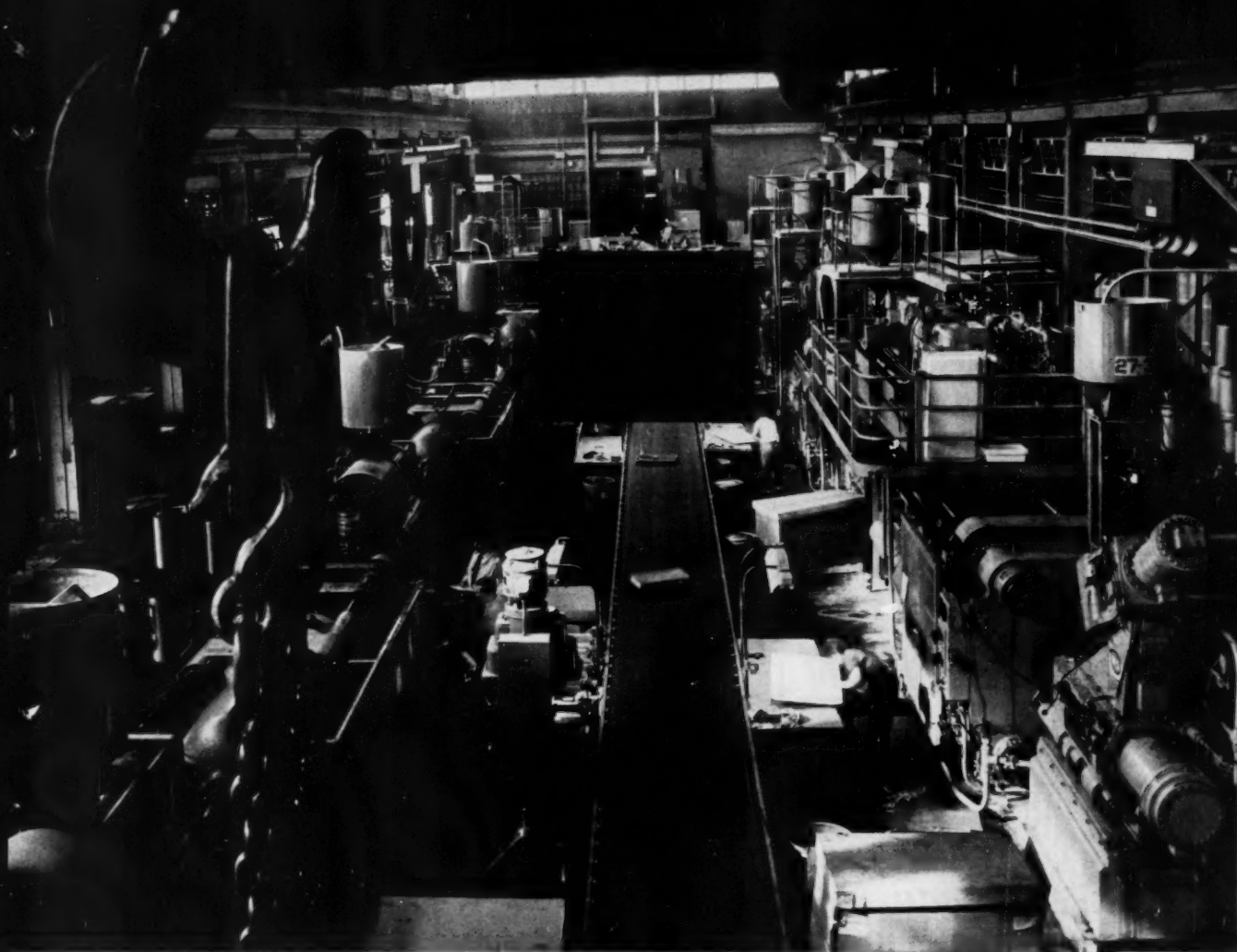
Erinoic

POLYSTYRENE

Manufactured by Plastic Engineers Limited, for
Industrial Appliances Limited—exclusive holders
of the patented 'press-click' opening action.

The containers are used
by the Kores Manufacturing
Co. Ltd., as packs for their
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ERINOID LIMITED · STROUD · GLOUCESTERSHIRE



new ideas come to life in plastics molded by General American

How many of your good ideas have died on a scratch pad? . . . simply because production wasn't practical.

At General American, manufacturers in many industries have seen their new ideas come to life in plastics. Here on the biggest, most versatile plastics production line anywhere, intricate shapes are molded in one "shot". For many products, volume production in plastics becomes a reality for the first time. Tremendous strength is coupled with light weight. Utility and durability team up with colorful new sales appeal never before possible.

For example, this conveyor belt, serving a double battery of injection presses in one of General American's plants, carries some of the world's largest, most intricate and unusual plastics moldings.

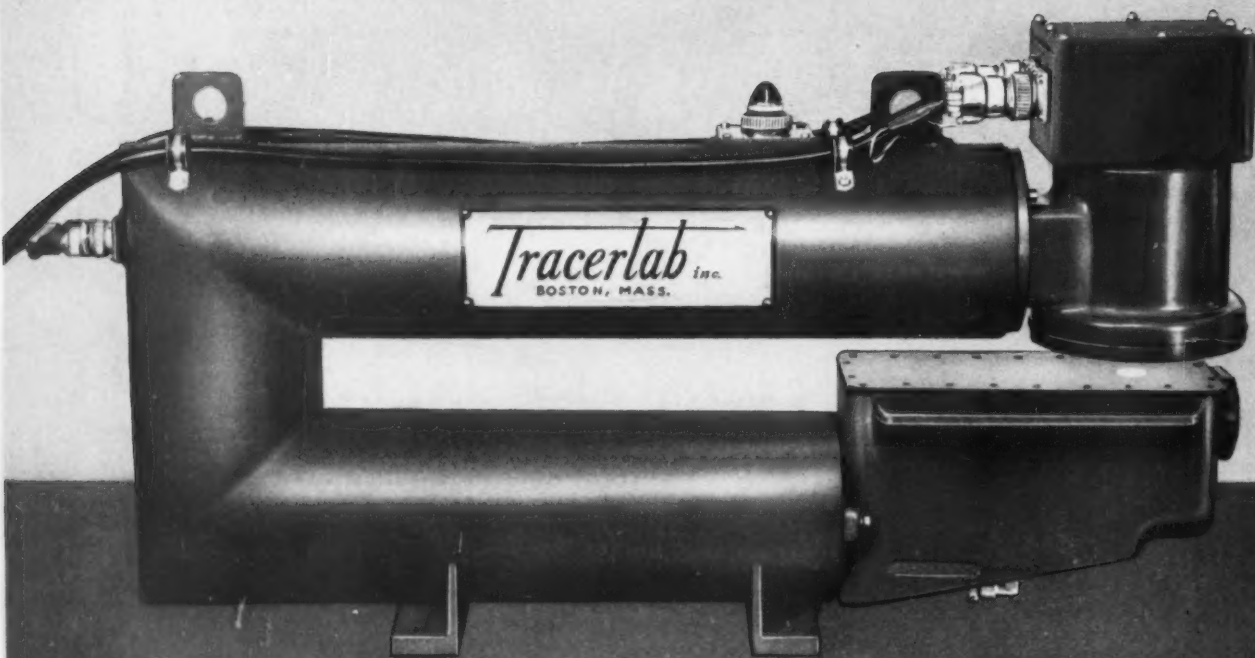
Here—yours to use . . . everything you need from development to delivery. Talk over your ideas *now* with a General American engineer.



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● Facilities unmatched anywhere: injection presses to 300 ounces, compression presses to 2,000 tons, reinforced plastics molding, die making, painting, assembly, packaging



Here's the NEW

CESIUM-137

BG-5 LIGHT MATERIALS BETA GAUGE

SEE THE BG-5 AT THE PLASTICS
SHOW—BOOTH 549—JUNE 7-10

Designed specifically for those mills producing light materials

Mills running light, critical materials may now use Beta Gauges to insure better product uniformity, cut raw material costs, and increase production. Tracerlab — the firm that made the first Beta Gauges — has licked the problem of using Cesium-137 as a source material. Its long-life, low energy beta rays make possible *for the first time* the gauging of the lightest materials with unexcelled stability and accuracy. Into the design and production of the new BG-5 have gone all the skills and knowledge amassed through the production and sale of the large majority of all beta gauges now in use. The BG-5 will enable you to:

- Cut raw material costs by running closer to minimum tolerance.

- Increase production by producing more first quality product.
- Enable you to get "on gauge" quicker, thus reducing wastage and off-goods.
- Improve quality by maintaining production standards. Continuous inspection vs. unreliable "spot" checking.
- Recorder accessory provides 24-hour production record of material variations.

The BG-5 Light Materials Beta Gauge can be used in automatic control arrangements; can be obtained with a variety of recorders; is equipped with a "C" frame having a throat depth to meet your requirements; has "all-angle" scanning mounts that provide across-the-sheet profiles.

Here's the answer to your control and quality problems . . . at a cost that any mill can afford. The details await your request.

GET THE FACTS NOW!!! There's a Tracerlab Beta Gauge direct-factory representative in your area waiting to demonstrate a gauge and tell you the full story of how the BG-5 can save you money. Write today to arrange a visit, and to get further information. Tracerlab, Inc., 131 High Street, Boston 10, Massachusetts.

Tracerlab[®] inc.
BETA GAUGE

Presenting



Now — A FIRE-RESISTANT Polyester opens a new market for you

Whenever you've thought about new customers for your polyester glass fiber fabrications, you probably have considered interior building applications.

Now, if you make polyester sheet, you can start thinking and *planning* for a building boom—with only your imagination to limit the future.

How can you use HETRON?

How would you *like* to use it?

See how HETRON's characteristics match up to your structural ideas:

Fire Resistance—Sheets and shapes made with HETRON are self extinguishing. They will not support a flame because HETRON has a high chemically bound chlorine content. "Tunnel" tests give it a flame spread rating of less than 100. And as little as 1%

antimony trioxide will give even lower flame spread.

Heat Resistance—In test after test, HETRON-based materials have proved their ability to resist heat degradation.

Better Fabrication—You'll find HETRON gives excellent results in molding curved and irregular shapes. That's because of low shrinkage and good flow characteristics.

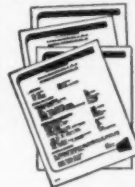
Plus Properties—Sheets and shapes made with HETRON won't rust . . . won't corrode . . . and won't rot.

You can now obtain HETRON polyesters in commercial quantities. They are light colored, transparent, viscous liquids. Hooker laboratories will cooperate fully with you in investigation of building applications or any other "use" ideas.

TYPICAL PROPERTIES

- Weight loss of castings:
After 168 hrs. at 392°F 2-3%
After 720 hrs. at 392°F 5-15%
- Flexural strength retention of glass cloth laminates (tested at room temperature)
After 168 hrs. at 392°F up to 90%
After 720 hrs. water immersion . . . 92%
- Shrinkage during curing 5%
- ASTM heat distortion point of castings up to 285°F
- Electrical properties of castings at 10⁹ cycles:
Dielectric constant 2.85
Power factor00575
Loss factor0164

FOR COMPLETE INFORMATION on HETRON resins, mail the coupon today. You'll receive technical data sheets listing properties of the liquid resins, cured unfilled resins, and glass cloth laminates. Includes general handling and curing recommendations, and other useful information.



HOOKER ELECTROCHEMICAL COMPANY,
18 Forty-seventh Street, Niagara Falls, N. Y.

Gentlemen: Please send me more information on HETRON resins.

Name Title

Company Address

City Zone State

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HOOKER ELECTROCHEMICAL COMPANY

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for impact materials and glass compounds

LOVEN

for liquid phenolic resins

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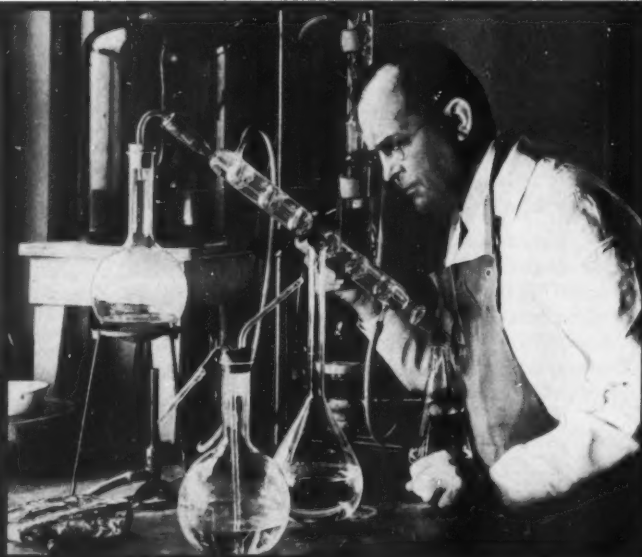
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for phenolic casting resins



WASHINGTON OFFICE: 705 Ring Building, Washington, D. C.

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Fittings for metal containers (spouts and caps for aerosol shaving soap)



For example—
Fittings for glass nursery bottles



For example—
Specialty items—Tire valve and battery caps



For example—
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Owens-Illinois packaging know-how and high-quality standards offer you the finest in molding plastic facilities . . . Injection molding . . . Compression molding . . . A complete range in plastics for packaging, for specialties.

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Portable Protection... a Case for U. S. Royalite!

Cutlery, tote boxes, ampoules, ointment tubes, salesbooks... a completely unrelated group of items, *but* they all had to be packaged to go somewhere, usually in a hurry, and arrive in perfect condition. This was the problem confronting the Fabri-Kal Corporation of Kalamazoo! They needed a material to fit every case and insure full protection, yet be easy and economical to work with. Fabri-Kal was sure—here was a case for U. S. Royalite!

This tough thermoplastic proved itself more than equal to every need. For cutlery, a strong display package that would attract the eye at point-of-sale and be a serviceable case that would wear well and be a handsome addition to a home.

Medical ampoules and tubes, so fragile to handle, were fitted securely in strong formed inserts of U. S. Royalite that held them firmly in a snap-grip fit. And salesbooks, carried from place to place, always in use, found U. S. Royalite's durability and appearance far superior to any other material. U. S. Royalite was the one answer Fabri-Kal found to its problems. Why not let it serve you, too? For complete information, write to the address below.



UNITED STATES RUBBER COMPANY
ROCKEFELLER CENTER • NEW YORK

SEE THIS

**BEING DONE at
Booth 662-761
Plastics Exposition:**

- Paint 3 Colors at once, at a steady production rate of

2,000 PER HOUR

Washing the Spray Masks Automatically

A completely NEW principle—and an immense improvement over all previous methods of production spraying. Only four masks per color are required. See it in operation, at the show!

OTHER *High Production* DECORATING EQUIPMENT by FINISH ENGINEERING



ROTO-SPRAYER paints up to 1200 parts per hour. Operator loads the part, touches the foot valve—and the machine does the rest. The part spins, guns go on, then off, rotation stops. Oscillating gun reaches the hard places. A complete painting machine including booth, fan, guns, pressure tank.

SEMI-AUTOMATIC SPRAYER paints small parts; mask holder is adjustable to take masks up to 12 x 12 in. In operation, foot pedal is pressed, an air operated hold-down pushes the part into mask—and the part is painted by an oscillating spray gun. The machine paints as fast as the operator can load parts.



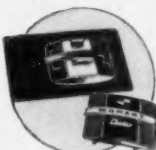
MULTIFIT SPRAY MASK CLAMP holds the mask and part in position while spraying—assures accurate painting, reduces rejects. Each Multifit clamp is quickly adjustable to a wide variety of parts and masks—is used over and over on various jobs, saving the cost of special fixtures. 3 standard sizes available.



AUTOMATIC DIAL WIPER cuts 65% to 85% off the cost of wiping dials—it's 3 to 8 times faster than hand methods. Wiping is done by a continuous roll towel, which may be laundered and reused. The operator loads, presses pedal, and the machine does a perfect wiping job. It makes the biggest savings on the really tough wiping jobs.



PRESSURE-FORMED SPRAY MASKS, made from special alloy that work-hardens to 113,000 psi tensile strength. Stronger and thinner for easier, faster spraying. Quicker cleaning of masks—and lower cost for mask maintenance. They cost you no more than the old-type masks.



INDIVIDUAL MASK WASHER. Each operator quickly cleans masks whenever needed, for smoothest production. Masks are submerged in solvent during the cleaning, then "pop-up" to dry after a timed cycle.



FINISH ENGINEERING CO. INC., 1115 Cherry St., Erie, Pa. Phone 5-4478



FINISH ENGINEERING CO., INC.

*kodak's
new reflectors*

* **BREATHE**
in a
LESTER

See that part? It's being molded on a 20 ounce Lester at Eastman-Kodak in Rochester, New York.

There's a ticklish molding problem involved:

This butyrate part, with a fairly large projected area, has a 3/16" x 1/4" bead running around the rim. To fill it properly, Kodak must use heated molds, meaning extremely molten material at the parting line. Despite this, the molds had to be vented without a trace of flash—the subsequent plating operation wouldn't allow it. How do you lick a problem like that? Easily, with central die height adjustment.

*On a Lester, with the patented single screw die height adjustment, with a twist of the wrist you can set the molds to open a fraction of a thousandth of an inch at full clamp—taking complete advantage of the full locking pressure, and still getting "metered breathing" or venting.

On routine molding jobs, Lesters will outproduce other equipment—on tough jobs like this, the Lesters make them seem routine. Write for complete machine specifications and ask for the Lester-Phoenix house organ, "The Lester Press".



See a new model LESTER running at our Booth 417-423
Free tickets available on request



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Dioctyl Sebacate
Dibutyl Sebacate

*PLASTICIZER SC
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Phosphate
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Also a Complete Line of Softeners.

COLORS...

STANTONE MBS (Masterbatch)
STANTONE GPE — Ground
Polyethylene
STANTONE PC — Paste
STANTONE Dry Pigment

STANTONE PVC — Polyvinyl Chloride
STANTONE RP — Vinyl Inks
STANTONE Rubber and Balloon Inks
STANTONE PDS — Powder Dispersed

STABILIZERS...

STABELAN E — Paste — For excellent heat and light stability and long outdoor
aging in Polyvinyl Chlorides and their copolymers
STABELAN GI — Paste — For harsh heat treatments. Protection for organic reds
STABELAN XL — Powder — Non-Toxic for food packaging
STABELAN HR — Paste — A "single package" stabilizer containing Cadmium and
Barium components and synergized chelating agent
STABELAN HR — Liquid — a synergized chelating agent
STABELAN HR — Powder — a metal bearing component of Stabelan HR paste

Write for complete data on these materials.

HARWICK STANDARD CHEMICAL CO.

AKRON, BOSTON, TRENTON, CHICAGO, LOS ANGELES

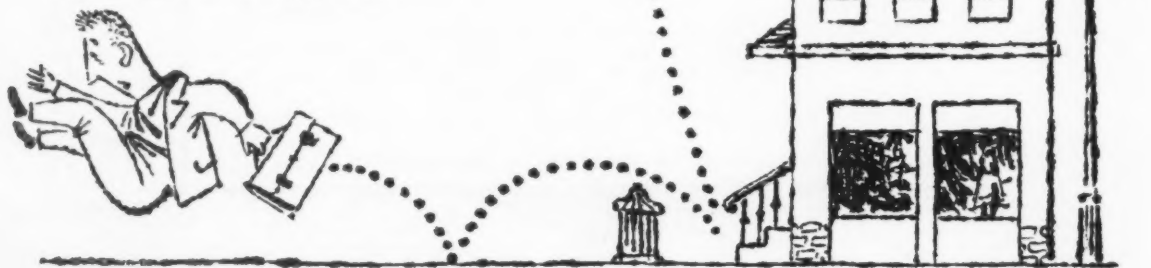
When you're tempted to give the old so-so the heave-ho

Shifting from one custom molder to another is, Boonton believes, serious business and should not be approached lightly.

One of the first things to weigh is the length of time you've been working together. That counts for plenty. After all, your molder has learned to work with your people; they've learned to work with his.

And then consider the "bone of contention" that is causing the present rift. Are *you* being reasonable? Would some other molder give you what your current molder can't? Just what will be gained by shifting?

BUT . . . if you've found your molder incompetent or irresponsible . . . if your personality and his meet head-on . . . if there is no reconciling your differences . . . by all means and without delay give the Old So-So the heave-ho. Then find yourself a custom molder like Boonton, tried and true, capable, honest, reliable. We'd be glad to welcome you to our fold. You are sure to be happy here.



BOONTON MOLDING CO.

BOONTON, NEW JERSEY

NEW YORK OFFICE—CHANIN BUILDING, 122 EAST 42ND STREET, OXFORD 7-0155

OVEN STABILITY AT 450°F*	0 MINUTES	10 MINUTES	20 MINUTES	30 MINUTES	40 MINUTES
Paraplex G-62—0% Diocetyl Phthalate—100%					
Paraplex G-62—25% Diocetyl Phthalate—75%					
Paraplex G-62—50% Diocetyl Phthalate—50%					
Paraplex G-62—100% Diocetyl Phthalate—0%					

STABILITY TESTS AT 450°F ON VINYL FILM PROVE VALUE OF PARAPLEX G-62 PLASTICIZER

**PARAPLEX G-60, PARAPLEX G-62,
and MONOPLEX S-71 for:**

- ... *Fast calendaring*
- ... *Long-term durability*
- ... *Low stabilization costs*
- ... *Uniform color*

*Tests based on this vinyl formulation:

Vinyl resin 100 parts
Plasticizer 54 parts
Cadmium-Barium Stabilizer 1.5 parts

MONOPLEX and PARAPLEX are trade-marks,
Reg. U. S. Pat. Off. and in principal foreign
countries.

The stabilizing effect of PARAPLEX G-62 in vinyl compounds is dramatically shown by the test samples above. PARAPLEX G-60 and MONOPLEX S-71 give similar results. Tests of durability, including Fade-Ometer, Weather-Ometer, and outdoor exposure, also demonstrate the ability of these plasticizer-stabilizers to impart resistance to embrittlement and discoloration.

In addition to their stabilizing effect, here are other key advantages of these Rohm & Haas plasticizers:

PARAPLEX G-60—polymeric-type, low volatility, good plasticizing efficiency, resistance to extraction by soap and water.

PARAPLEX G-62—polymeric-type, low volatility, low migration, excellent resistance to extraction by soapy water, oil and gasoline.

MONOPLEX S-71—monomeric-type, flexibility at low temperature, high plasticizing efficiency, lower volatility than conventional monomeric plasticizers.

CHEMICALS

FOR INDUSTRY

ROHM & HAAS COMPANY

THE RESINOUS PRODUCTS DIVISION

Washington Square, Philadelphia 5, Pa.

Representatives in principal foreign countries

DON'T MISS

SIXTH NATIONAL
PLASTICS EXHIBITION
CLEVELAND, OHIO • JUNE 7-10

BOOTH 724

THE MOSLO BOOTH

THERE'S A SURPRISE
IN STORE FOR YOU
COME
AND
SEE!

See the *new* High Speed Fully Automatic Model 73 . . . Shoots a full 2 ounce shot. Capacity 25 pounds *plus* per hour. Molds 20 square inches of area *plus*. Rated at 1200 cycles per hour. This model will be in operation at the show.



SEE THE NEW RE-DESIGNED MOSLO LINE — FULLY AUTOMATIC FOR ALL REQUIREMENTS

Learn the production-boosting details of the new MODEL 75 high speed automatic with l-o-n-g stroke . . . two to three ounce shot . . . mold opening to suit requirements . . . see the New Model 80—3 to 4 ounce with 75 pounds plasticizing capacity and many outstanding

features. Whatever you do, don't miss the Moslo Exhibit at the National Plastics Exhibition.

If you can't make it to the show, write or call and we'll see that you get the information you need concerning these modern plastic molding machines.

MOSLO MACHINERY COMPANY

2443 PROSPECT AVENUE • CLEVELAND 15, OHIO

ANOTHER PROBLEM IN PLASTICS MOLDING SOLVED BY *J.G.TILP INC.*



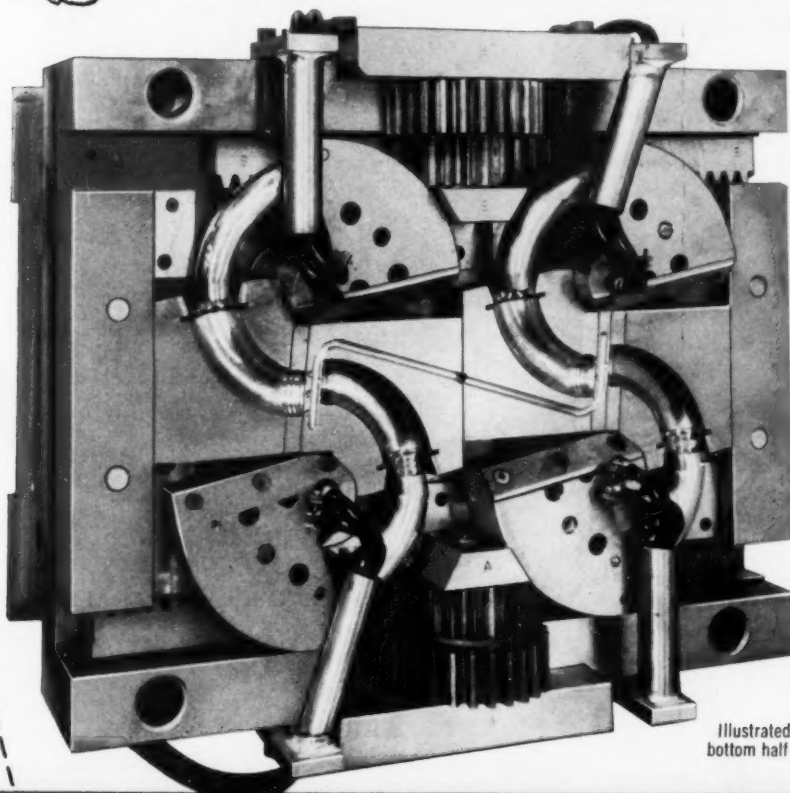
THE PROBLEM

To construct a mold for polyethylene container spouts that would:
 ... eliminate core drift and maintain uniform wall section
 ... control molding temperature
 ... provide automatic radial core movement




THE SOLUTION

4 cavity automatic rotary pulled cores with self-contained cooling



We can now
 service your
 HARD CHROME
 PLATING
 requirements.

Illustrated above
 bottom half of mold



Here's the molded spout.

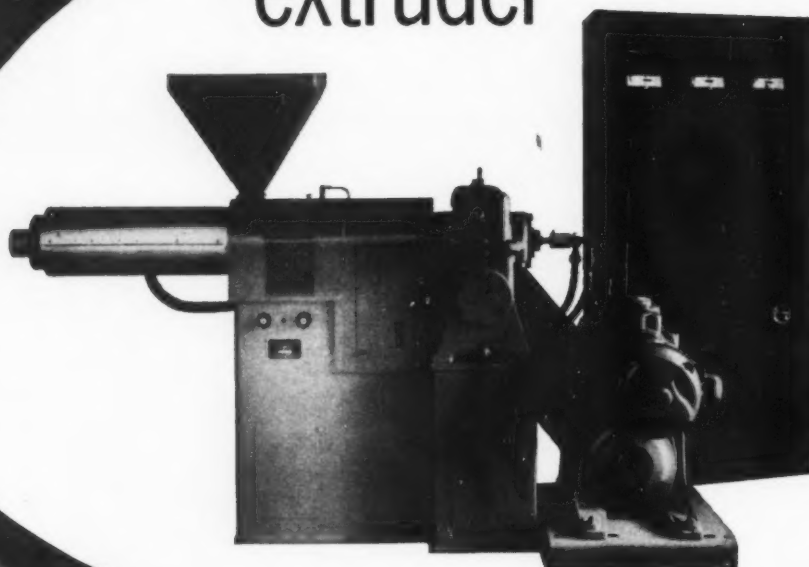
J.G.TILP

MANUFACTURERS OF INJECTION MOLDING EQUIPMENT, PLASTIC MACHINES AND
 PRECISION MACHINED AIRCRAFT PARTS.

Springfield 6, Illinois Dept. 1000
 Phone BR 5-1, Union, N. J. APB 4-1000 1-720

Egan

extruder



Remote
Control
Panel

Internal wiring for extruder and control panel complete to coded terminals for quick installation at any location.

FOUR SEPARATE MAIN COMPONENTS

- "Tailored" Screw ● Independent Thrust Bearing Housing
- Individual Feed Section ● Heavy Wall Cylinder

ALL WITH IMPROVED FEATURES

for increased production, reduced maintenance and complete flexibility. Designed to meet ANY requirements. Can be supplied complete with dies and take-off equipment.

Write for details or invite our representative to call

FRANK W. EGAN & COMPANY

Designers and Builders of Machinery
for the Paper Converting and Plastics Industries
Bound Brook, New Jersey

Cable Address "EGANCO"—BOUNDBROOK, N.J.



LESS THAN .0002" VARIATION IN PLASTIC GAGE

*...with calender rolls
on TIMKEN® precision bearings*

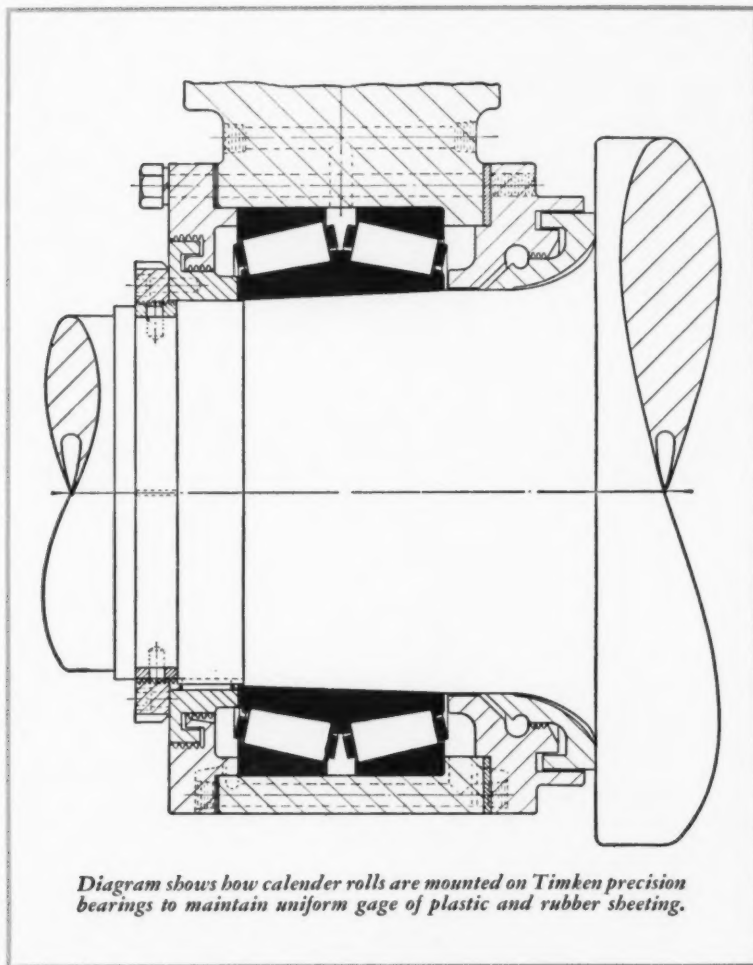


Diagram shows how calender rolls are mounted on Timken precision bearings to maintain uniform gage of plastic and rubber sheeting.

GAGE of plastic sheeting can be held 40 times closer when you mount calender rolls on Timken® tapered roller bearings instead of old-type sleeve bearings! With Timken precision bearings, gage can only vary plus or minus .0002", while variation with sleeve-type bearings can total as much as .008".

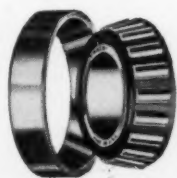
By holding gage to minimum tolerances, Timken bearings increase yield. You get more yards per pound of material. And these closer tolerances also reduce scrap loss where you imprint on sheeting.

Because the tight fit between the neck and the inner race of the Timken precision bearing eliminates roll neck wear, roll necks do not require re-machining. Down-time is minimized!

The tapered construction of Timken bearings lets them take radial and thrust loads in any combination. Line contact between the rollers and races gives extra load-carrying capacity. And Timken precision bearings are made of the finest steel ever developed for bearings—Timken fine alloy steel. The only way we can get steel good enough for Timken bearings is to make our own. No other U. S. bearing manufacturer does it.

Approximately forty calender stands are now on Timken bearings with bearing sizes ranging from 10 inches to 29 inches O.D. Get all the advantages of Timken tapered roller bearings in your calenders, mills, refiners and mixers. For complete information, write The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

TIMKEN
TRADE-MARK REG. U. S. PAT. OFF.
TAPERED ROLLER BEARINGS

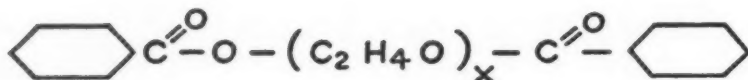


NOT JUST A BALL NOT JUST A ROLLER THE TIMKEN TAPERED ROLLER

BEARING TAKES RADIAL AND THRUST LOADS OR ANY COMBINATION

announcing 8 new benzoate esters

WITH WIDE RANGE OF PROPERTIES



**How can
they
help you?**

TENNESSEE announces a new series of glycol dibenzoate esters, each with special properties that may improve your product or processing. They are *light-colored, stable, mild-smelling*, and have *high-boiling* points. Their property range varies widely in freeze points, viscosity, and solubility . . . especially *solubility of water* in the higher glycol members. *Suggested Uses:* plasticizers for polyvinyl, cellulosic and phenol-formaldehyde resins. Other potential uses: lubricants, textiles, leather, adhesives and flotation.

Write on your letterhead to Dept. M-6 for experimental samples and technical data.

TYPICAL PROPERTIES OF NEW *Benzoflex* ESTERS

Benzoflex Number	9-98*	2-45*	E-60	T-150	P-200	P-300	P-400	P-600
Chemical Name	Dipropylene Glycol Dibenzoate	Diethylene Glycol Dibenzoate	Ethylene Glycol Dibenzoate	Triethylene Glycol Dibenzoate	Polyethylene Glycol 200 Dibenzoate	Polyethylene Glycol 300 Dibenzoate	Polyethylene Glycol 400 Dibenzoate	Polyethylene Glycol 600 Dibenzoate
Color APHA	100	50	50	100	100	150	150	300
Boiling Pt. @ 1 mm. Hg., °C.	195-200	200-205	....	223-37	217-290	243-327	258 d.	200 d.
Specific Gravity @ 25°C.	1.129	1.178	Solid	1.168†	1.158	1.150	1.145	1.141
Freeze Point, °C.	<-35	28 16	70-2	47	<-35	<-35	<-35	3.8
Pour Point, °C.	-20	-25†	Solid	Solid	-30	-30	-35	Solid
Flash Point, °C.	212	232	186	237	248	258	254	264
Refractive Index @ 25°C.	1.5282	1.5424	Solid	Solid	1.5252	1.5137	1.5077	1.4984
Viscosity (cps. @ 20°C.)	215	110	Solid	Solid	101	130	167	330
Solubility, % @ 25°								
In water	insol.	insol.	insol.	0.05	0.80	0.14	0.70	0.78
Water in	0.45	1.0	....	....	2.3	8.3	16.5	32.0
Aliphatic Hydrocarbons	sol.	sl. sol.	insol.	sl. sol.	insol.	insol.	insol.	insol.
Aromatic Hydrocarbons	sol.	sol.	sol.	sol.	sol.	sol.	sol.	sol.

*—Available in commercial quantities. All others now available in development quantities only.

†—Supercooled liquid.

Producers of:

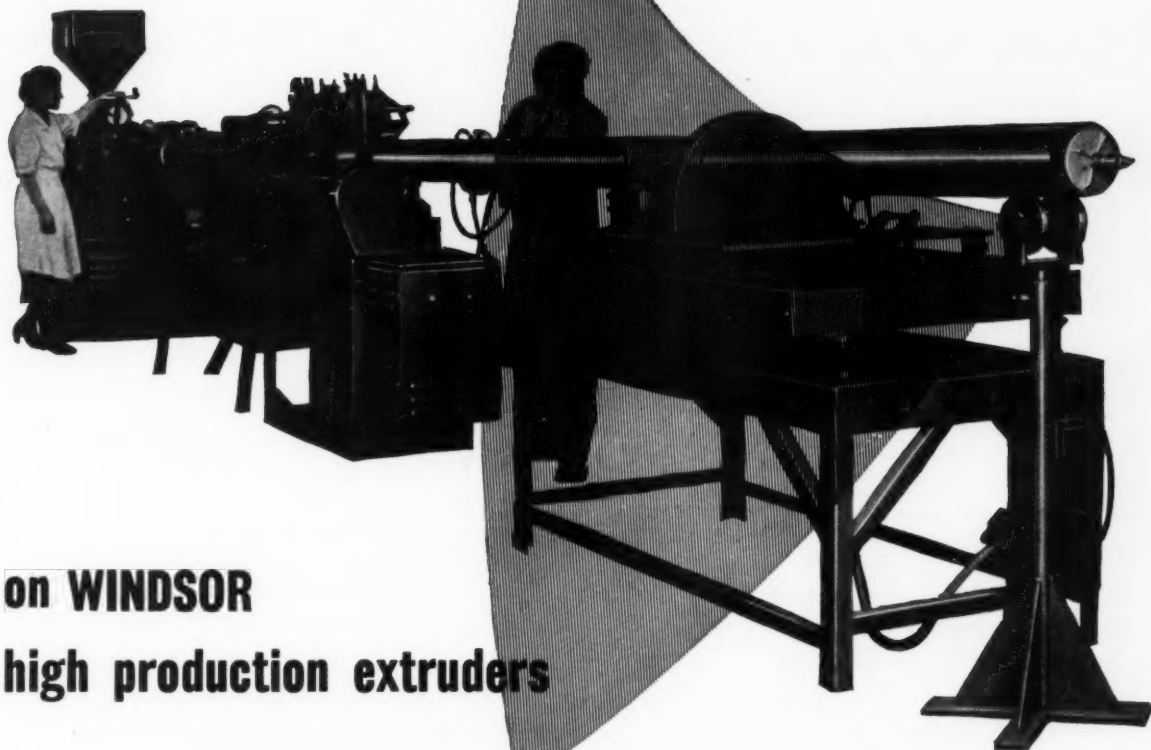
FUELS • METALLURGICAL PRODUCTS • TENSULATE BUILDING
PRODUCTS • AROMATIC CHEMICALS • WOOD CHEMICALS
AGRICULTURAL CHEMICALS



TENNESSEE
PRODUCTS & CHEMICAL

Corporation
NASHVILLE, TENNESSEE.

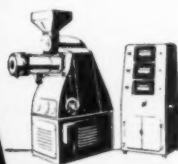
QUALITY EXTRUSIONS



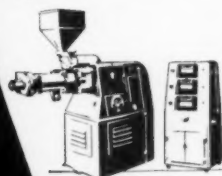
on WINDSOR
high production extruders



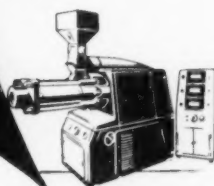
The photographs on this page are by courtesy of Messrs. Wallington Weston & Co., Ltd., Frome, Somerset, England. The R.C.100 extruding 6" outside diameter pipe from "Fromoplas HT" material.



R.C.65. This is a twin-screw variable speed extrusion and compounding machine with an hourly output of 65 lb. plus. An automatic feeding device for metering plastic material to the extrusion screws is incorporated and automatic heating regulation is provided.



R.C.100. The R.C.100 twin-screw machine is a medium capacity extruder with a nominal output of 100 lb. per hour and will operate continuously over long periods, producing tubes, rods and sections in thermoplastic materials. Coated cables, rods and tubes are standard jobs.



R.C.200. Three screws provide this heavy duty machine with exceptional mixing powers. With a nominal output of 200 lb. per hour, constant extrusion pressures, and trouble free operation, it satisfies the demand for a multi-screw machine of really high output.

Exclusive Distributors for U.S.A.:
F. J. STOKES MACHINE CO. Philadelphia 20, Pennsylvania
Canadian Representative:
WILMOD CO. PLASTIC DIVISION 2488 Dufferin Street, Toronto

WindSOR LTD

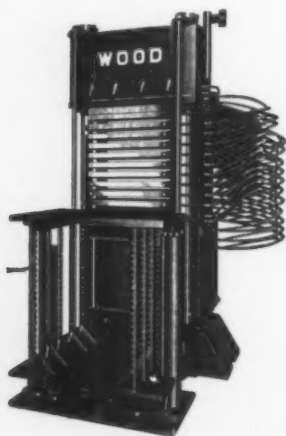
LEATHERHEAD RD., SURBITON
SURREY • ENGLAND



How do you feel about leaning ladders?

IN RUBBER AND PLASTICS, THE PAYOFF'S
AT AN R. D. WOOD PRESS LIKE THIS ONE!

This 880-ton multiple opening platen press is designed for polishing and laminating plastic sheets. The complete ten opening sheet production unit includes a twenty opening loading and unloading elevator. R. D. Wood hydraulic presses are made in a full range of sizes and capacities, for many uses. Ask for catalog, and for engineering aid—both yours without obligation.



If you're human, it's likely that you've been tempted, at one time or another, to put superstition to the test. But—you probably decided *not* to walk under that ladder on the theory that it's better to let well enough alone. If you acted the same way in business . . . if you didn't feel compelled to know the always changing facts about production, markets, methods and all the rest . . . you'd have trouble in bunches. Take an hydraulic press, for instance. If your business uses presses, you ought to know something about them . . . how they can profit you. Find out about a Wood press—and be pleasantly surprised. You owe it to your stockholders. Ask for descriptive catalog.



R. D. WOOD COMPANY

PUBLIC LEDGER BUILDING • PHILADELPHIA 5, PENNSYLVANIA

Representatives in Principal Cities



MAKERS OF HYDRAULIC PRESSES AND VALVES



FIRE HYDRANTS



CAST-IRON PIPE



GATE VALVES



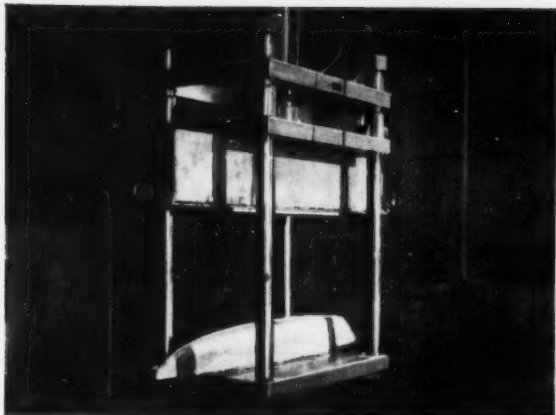
GAS PRODUCERS



ACCUMULATORS



users report big savings with sprayed metal tooling



Photos courtesy Narmco Mfg. Co., San Diego, Cal.

Typical glass laminated part produced from sprayed metal tooling in press shown. Match molds for this jet aircraft wing tip were built up with alternating layers of sprayed aluminum and bronze over sprayed zinc base and backed with copper tubing, reinforced and insulated with laminated glass cloth. Tubing carries steam for cure, after which cold water is used to chill male for next layup.

new bulletin provides data round-up on current successful applications

Reports from users of sprayed metal tooling on recent successful applications form the basis for a new data bulletin, now available without charge. These case histories demonstrate the substantial savings in time and money over other tooling methods, point up possible pitfalls that can be avoided in tool design and fabrication.



Data covers general procedures, describes and illustrates tooling now in use and plastic production parts. Write for a copy of this new data bulletin, or use the handy coupon below.



Don O. Watson
METALLIZING ENGINEERING CO., INC.
38-14 30th Street, Long Island City 1, New York
Please send me free copy of Bulletin 111 —
Sprayed Metal Tooling. No obligation, of course.

NAME _____
TITLE _____
COMPANY _____
STREET _____
CITY _____ ZONE _____ STATE _____

METALLIZING ENGINEERING CO., INC.

38-14 30th Street



LONG ISLAND CITY 1, N. Y.

In Great Britain: METALLIZING EQUIPMENT COMPANY LTD. Chesham near Woking, England

YOU CAN'T LOSE

with this pair of production aces



See Them
in Action
at the
Plastics Show

Booths 819 & 918

BIPEL Horizontal Hydraulic Pelleters

These unique pelleters combine all the advantages of *hydraulic* operation with the speed of production of mechanical preforming. Filling takes place within the hopper, keeping the machine and its surroundings unusually clean.

The powder is compressed, not by a blow as in mechanical preforming, but by a *steady squeeze* that is applied as long as needed to achieve compaction. Proper dwell and pressure for a particular powder can be set in a few seconds.

The die rides completely free during the squeeze, which is equivalent to applying pressure on both punches. As a result, pellet density is always uniform.

- self-contained—includes motors and pumps
- minimum power consumption
- no moving parts enter between the punches

maximum pressure	12 tons	35 tons	70 tons
maximum strokes per hour	2280	1260	720
typical pellet weight*	.2—1.2 oz. (1 1/2" dia.)	3.7—8.1 oz. (3" dia.)	8.3—18 oz. (4 1/2" dia.)

*based on average powder density of .35 ozs. per cubic inch

American inquiries to—

Ralph B. Symons Associates, Inc.
3571 Main Road, Tiverton, Rhode Island



BIPEL "Auto-Control" Compression Presses

Bipel downstroking prefiller presses bring users a production premium of *several extra cycles every hour*. These high efficiency presses really exhibit their value in the molding of small multi-cavity components where cure is short and open press time for stripping and reloading is relatively high.

They feature the patented "auto-control" which, once set, reproduces even the most complex molding cycle. Thus, rejects are virtually *eliminated*. Tolerance control is better than average.

Bipel's unusual central power source makes for inexpensive installation and operation. In-the-press intensification offers a choice of three working pressures per press.

- operator's judgment never affects cycle
- extremely fast clamp and transfer
- available in single or multi-press installations

Type 40	Type 100	Type 200
20, 40 or 60 tons	50, 100 or 150 tons	100, 200 or 300 tons

B. I. P. ENGINEERING LTD.

Aldridge Road, Streetly, Staffordshire, England

Modern Plastics

MODERN PLASTICS

Advertising Deadline: June 28

ENCYCLOPEDIA ISSUE

Publication Date: September, 1954

WHAT IT IS

The Modern Plastics Encyclopedia Issue is published annually in September as the thirteenth issue of Modern Plastics magazine . . . and goes to all Modern Plastics subscribers. It's the accepted "work-book" of the plastics field . . . bound in handsome hard covers . . . carries the advertising of all the field's leading suppliers . . . answers practically all questions relating to plastics: materials and their properties, their applications, production methods, processing equipment and machinery . . . contains the only complete Buyers' Directory in the field . . . is completely revised each year to cover all new developments and changes.

WHO READS IT?

This new edition will have the same circulation as Modern Plastics magazine. Currently the figure stands at 22,185—an all time high.

This circulation covers not only the plastics materials and processing industry but also the major buying influences in the many plastics-using industries. Specifically, it carries your sales message to:

1. **Plastics materials suppliers.**
2. **Molders, mold-makers, fabricators, laminators, extruders, and processors of film, sheeting and reinforced plastics.**
3. **The manufacturing companies primarily engaged in other industries who either (a) buy finished plastics parts and products; (b) buy semi-finished plastics products and do part of the finishing themselves; (c) mold or fabricate their own plastics parts or products in "captive" plastics plants.**

WHAT DO THESE READERS BUY?

A glance through this issue of the magazine will give you a fairly good cross-section of the kinds of materials, sup-

plies, services and equipment that users of plastics buy. Basic purchases include all of the following:

CHEMICALS AND MATERIALS

adhesives	organosols
coatings	solvents
extenders	colorants
plastisols	plasticizers
stabilizers	laminates
dyes	saturating papers
glass fibre	wetting agents
synthetic resins	mold steels
fillers	lubricants

EQUIPMENT

hydraulic systems	scales
granulators	drills
buffers & polishers	extruders
mixers	drill presses
pyrometers	accumulators
cutting tools	heat sealers
lathes	mills
grinders	embossers
molding presses	timers
calenders	duplicators
slitters	control instruments
hobbing presses	motors

SERVICES

industrial designing	deep drawing
assembling	postforming
hobbing	fabricating
plating	embossing
molding	decorating
laminating	mold making

DO THE READERS USE IT?

Last year John T. Fosdick Associates, a prominent research organization, conducted a nation-wide field study among a cross-section of readers in 16 cities. Their report says:

- 93% keep the Encyclopedia "near at hand."
- 6% use it almost every day.
- 13% use it at least twice each week.
- 30% use it at least every other week.
- 87% refer to it at least every other month.

WHAT KIND OF ADS WORK BEST?

Readers of Modern Plastics Encyclopedia Issue want detailed, usable facts, not broad claims or fancy artwork. When they turn to the Encyclopedia Issue, they're getting down to "brass tacks"—comparing, evaluating, making buying selections.

Here are characteristic reader comments as reported by John T. Fosdick Associates:

- " . . . need more technical data"
- " . . . give an idea of price range"
- " . . . more data on actual applications"
- " . . . give more complete physical and chemical properties"
- " . . . be specific in performance of machinery"
- " . . . too many ads have incomplete data"
- " . . . advertising is too general"

ORDER ADVERTISING SPACE NOW

MODERN PLASTICS ENCYCLOPEDIA ISSUE,
575 Madison Avenue, New York 22, N. Y.

1. ☐ Please send me full details about the Encyclopedia Issue.
2. ☐ Reserve space for me in the Encyclopedia Issue in the amount encircled below.

SPACE	BASIC RATE*
Two pages	\$930
One page	475
Two-thirds page	370
One-half page	290
One-third page	220
One-quarter page	185

* Lower rates apply to regular advertisers in Modern Plastics magazine. Ask for details.

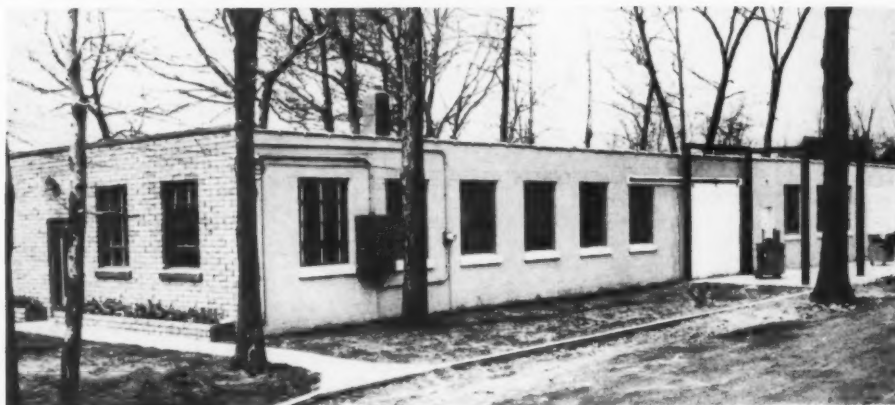
Name

Company

Address

Robbins

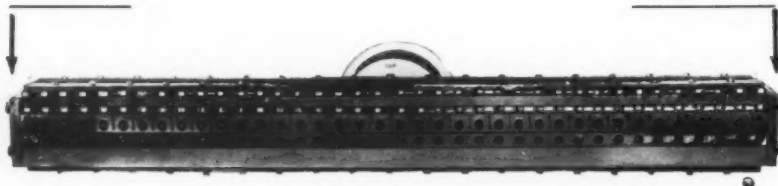
PLASTICS EXTRUSION ACCESSORIES



Never say die . . . say *Robbins* die

ZONED HEATING

ADJUSTABLE LIPS



Readily Adapted
To Your Extruder

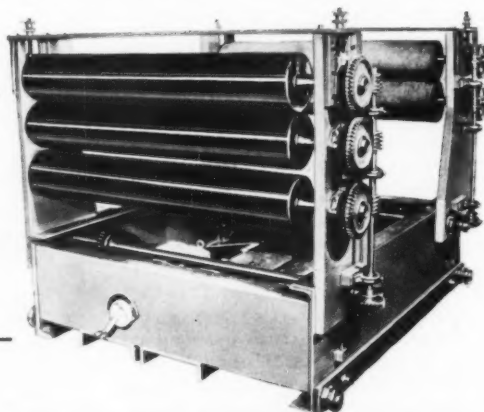
Available in Widths
Up to 60"

SHEETING DIES

for High Impact Styrene • Cellulose Acetate • Butyrate

SHEETING HAUL-OFF UNITS

Complete with Superfinished rolls and incorporating a variable speed transmission driving through a heavy-duty worm gear arrangement (shown with guards removed) to provide smooth tension on the extruded sheet.



ROBBINS TOOL & DIE COMPANY

1430 Mishawaka Street
Elkhart, Indiana

Plastics Extrusion Dies a Specialty

SOFT PLASTICS

Vinyl Plastisols

The versatility of vinyl dispersion (Plastisol) compounds lends itself to many wide and varied applications. The Watson-Standard laboratories can help you adapt these products to production and end uses.

Molding:

Watson-Standard Vinyl Plastisols and Rigidols have been used with both slush molding and dip molding. Such items as doll and doll parts, toys, spark plug covers, electrical components, novelties, puppets, toilet valves, boats, light sockets and others are illustrations of this type of application.

Dipping:

Watson-Standard Vinyl Organosols and Plastisols have been applied by dipping. Varied end products include dishwasher baskets, dish racks and drainers, electrical wiring, gloves, and springs for the automotive and upholstery industries.

Spreading:

Watson-Standard Vinyl Plastisols and Organosols may be spread coated. Coated textiles and paper are typical of this type of application.

Spraying:

Special foundations of Watson-Standard Vinyl Organosols and Plastisols may be applied by spraying. Finishes for metal furniture, cabinets and blowers are representative uses.

Casting:

Since Watson-Standard Vinyl Plastisols are in liquid form and may be readily poured, they lend themselves to casting. Casting applications include films, sealants for automotive and refrigeration industries, ceramic pipe joint threads, and potting compounds.

Troweling:

Watson-Standard Vinyl Plastisols may be formulated for troweling. This type of application lends itself to linings for tanks and sealants.

The Watson-Standard laboratories have formulated compounds for many end uses and methods of application. We will assist you with your problems.

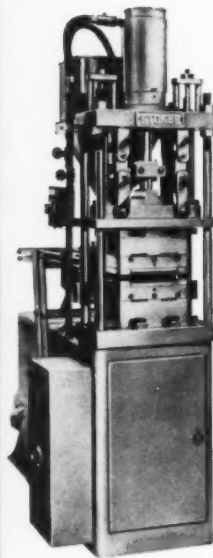
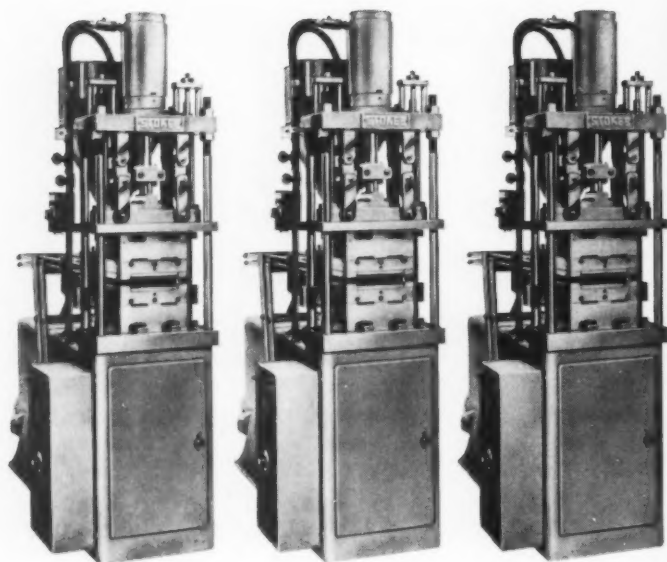
Watson-Standard
CO.

225 GALVESTON AVE., PITTSBURGH 30, PA.

NEW YORK OFFICE: 15 Park Row, New York 38, N. Y. • CHICAGO OFFICE: 55 E. Washington St., Chicago 2, Ill.

PLASTICS • INDUSTRIAL FINISHES • CHEMICALS





Molding machine courtesy
F. J. Stokes Machine Co.
Philadelphia, Pa.

Faster curing new **DURITE GP-102** adds 25% capacity

Users of DURITE GP-102 have found it cures an average of 25% faster. This gives more capacity from each press . . . lower cost per part.

DURITE GP-102, in black or brown, produces molded parts with rich surface lustre and good strength. Available in hard or medium flow. The unique flow and cure characteristics of DURITE GP-102 make it adaptable for a wide range of applications . . . for compression, transfer

and plunger molding.

Get all the facts about this versatile phenolic molding compound. Mail the handy coupon below for a sample and descriptive literature . . . or to arrange a demonstration by your DURITE representative in your plant. See it molded at Borden's Exhibit at the National Plastics Exposition, Public Auditorium, Cleveland, Ohio—June 7-10th.

The Borden Company, Chemical Division
DURITE Products Department
5000 Summerdale Avenue, Philadelphia 24, Pa.

MP-54

- ☐ Please send sample and technical description of DURITE GP-102
☐ Please have your technical representative arrange a demonstration of GP-102 in my plant

NAME.....TITLE.....

COMPANY.....

ADDRESS.....

CITY.....ZONE.....STATE.....

DURITE



THE *Borden* COMPANY
CHEMICAL DIVISION

Phenolic Molding Compounds • Abrasive and Frictional Bonding
Resins • Molding and Specialty Resins • Lamp Basing Cements

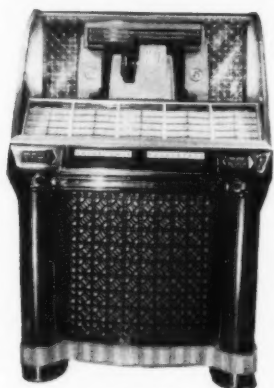
Modern Plastics

BRIGHT SALES

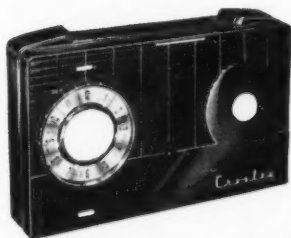
on the horizon with

MIRRO-BRITE

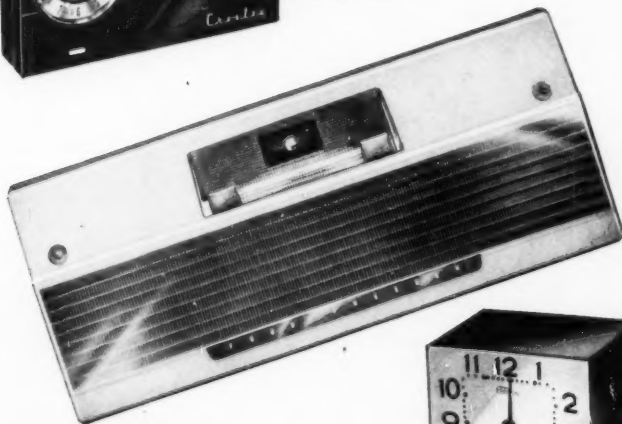
metalized plastics



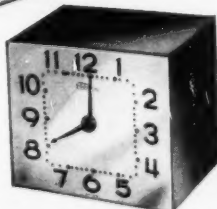
JUKE BOX
INTERIOR



RADIO DIAL



REFRIGERATOR
PANEL & NAMEPLATE



CLOCK
FACE



VACUUM
FORMED
DISPLAY
SIGNS

- Beautiful to look at, economical to use, Mirror-Brite is making shining sales for countless products.
- New products using Mirro-Brite include major appliances such as refrigerators, stoves, radios, television sets; toys and novelties; point of sale signs and three-dimensional displays; juke boxes; set-up boxes; greeting cards.
- Mirro-Brite metalized acetate, butyrate, and polystyrene can be vacuum formed, embossed, die-cut, laminated, silk screened and processed in countless ways.
- Available in rolls and cut to size sheets.
- Write for descriptive booklet, color card and samples.

Illustrated on this page are some products using Mirro-Brite . . . a preview of what you will see at our Booth 323 at Cleveland Auditorium, 6th National Plastic Exposition, June 7 to 10, Cleveland, Ohio.

COATING PRODUCTS

June • 1954

101 WEST FOREST AVENUE, ENGLEWOOD, N. J. Dept. MP6

113

Quinn-Berry

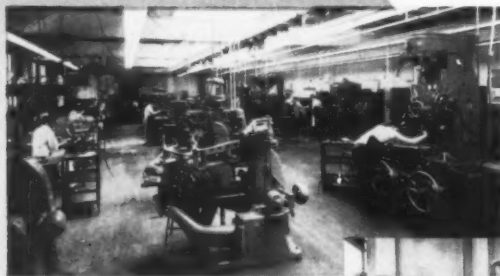
Designed to serve you...

The new, larger quarters now occupied by Quinn-Berry Corporation are designed to make possible the most efficient production methods. Modern equipment, excellent lighting and practical floor planning combine to produce highest quality workmanship.

Illustrated here are portions of the new Quinn-Berry plant. Here you can see the complete services available to you at Quinn-Berry. Every step, from original design to finished product, is here under one roof. Our molds are made in our machine shop by some of the finest craftsmen in the country.

Our production experience covers nearly every industry . . . aviation, electrical, business machines, housewares, automotive and many more.

These modern, efficient facilities and our diversified design and production experience are yours for the asking. Consult with us the next time you have a problem involving plastics.



Here are pictured three departments in the new Quinn-Berry plant. At top is a portion of the engineering department where parts and molds are designed. Next is a section of large machine shop where we make our own molds. At bottom is a view of press room showing row of newly installed, modern presses.



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Harry R. Bre'hen
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Townsend 8-2577

Harwood Molded Products
Fairport Road
East Rochester, New York
Hillside 4352

John Weiland, Jr.
7105 Grand Parkway
Milwaukee 13, Wisconsin
Greenfield 6-7161

Austin L. Wright
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QUINN-BERRY

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PLASTICS

MOLDERS OF ALL TYPES OF THERMOPLASTIC MATERIALS



THINNEST, STRONGEST OF ALL PLASTIC FILMS

new Du Pont MYLAR

REG. U.S. PAT. OFF.

DOES AN AMAZING VARIETY OF JOBS BETTER



Strongest of all plastic films! An exceptional tensile strength, one-third the strength of steel, is just one of the properties of "Mylar" that may help you improve your product.

New possibilities of product improvement—in fields as far apart as electrical capacitors and high-fashion fabrics—are opened by Du Pont "Mylar" polyester film. This new product of Du Pont research offers an unusual balance of electrical, physical, chemical and thermal properties. Its tensile strength of 23,500 p.s.i. permits its manufacture in gauges as thin as $\frac{1}{4}$ of a mil (0.00025 inch).

"Mylar" has a high dielectric strength and a relatively low power factor. These properties, together with its outstanding mechanical properties and thermal stability, make it ideal for a variety of insulating purposes.

Chemically inert, solvent-resistant and moisture-insensitive coverings result when "Mylar" is laminated to aluminum foil, kraft, and asbestos papers. These laminations form a tough, durable vapor barrier . . . an easily applied, cost-cutting protection for thermal insulation.

If you would like to evaluate the

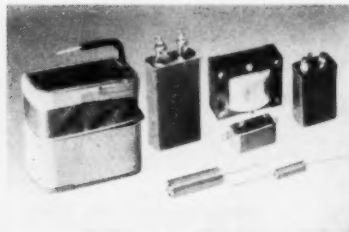
DU PONT "MYLAR"

Polyester Film



REG. U.S. PAT. OFF.

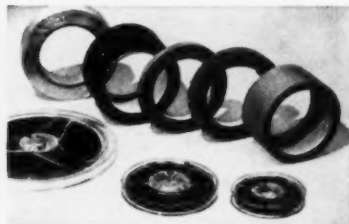
BETTER THINGS FOR BETTER LIVING . . . THROUGH CHEMISTRY



Balance of properties offered by "Mylar" permits insulation that takes up less space . . . resists extremes of temperature and humidity.



Attractive patterns printed on "Mylar" may be bonded to acoustical tile. This decorative surface is easily cleaned . . . actually improves acoustical efficiency.



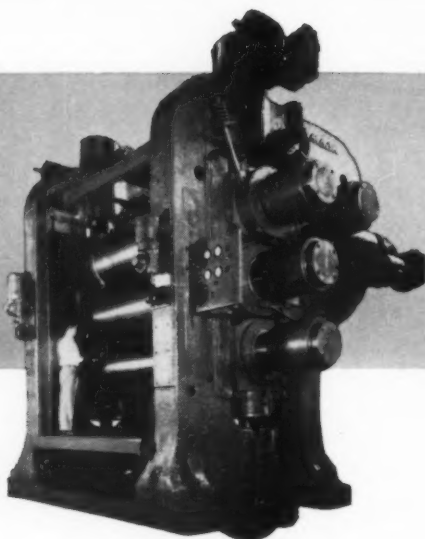
High tensile strength and dimensional stability of "Mylar" make it useful for a variety of recording and industrial tapes.

possibilities of "Mylar" for improving your own products, send for your copy of a new booklet that shows where this versatile film's properties can be used to advantage. Write to: E. I. du Pont de Nemours & Co. (Inc.), Film Department, Room No. 2M, Wilmington 98, Delaware.



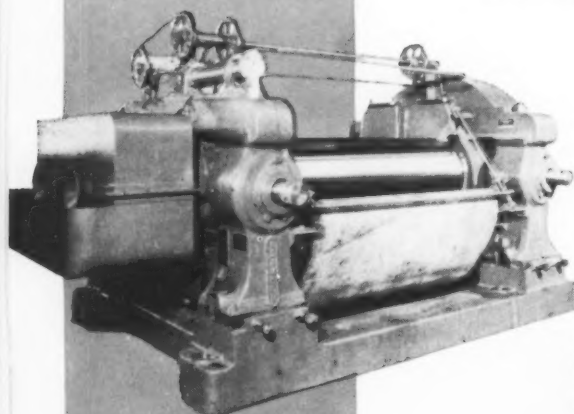
CALENDERS

We make all types and sizes of Calenders, precision designed for extremely close tolerances to meet the most exacting requirements in the production of plastics film or the coating of fabrics with rubber or plastics. The unit shown is an ADAMSON UNITED 32" x 92", 4-Roll Plastics Calender geared to produce 72" wide vinyl film, 2 mils. or less in thickness at speeds to 150 YPM.



RUBBER and PLASTICS —

... designed and built by...



MILLS

An 84" Individual Mill equipped with a mixing apron. ADAMSON UNITED Mills may be had in all sizes from 6" x 16" to 28" x 84", driven individually; in pairs with right angle reducer between the units, or grouped on a line shaft with reducer at one end of the shaft. Apron, as shown, can be installed on any type of existing mill. New catalog No. 463 on request.

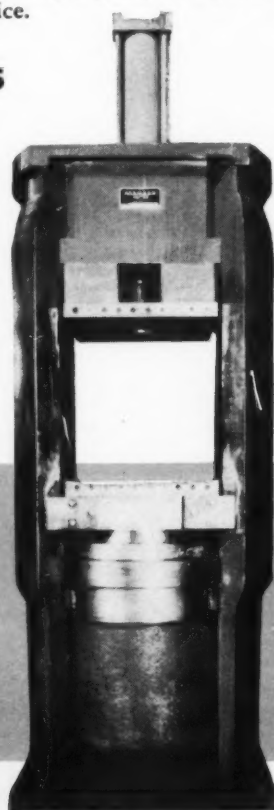


AUTOCLAVES or VULCANIZERS

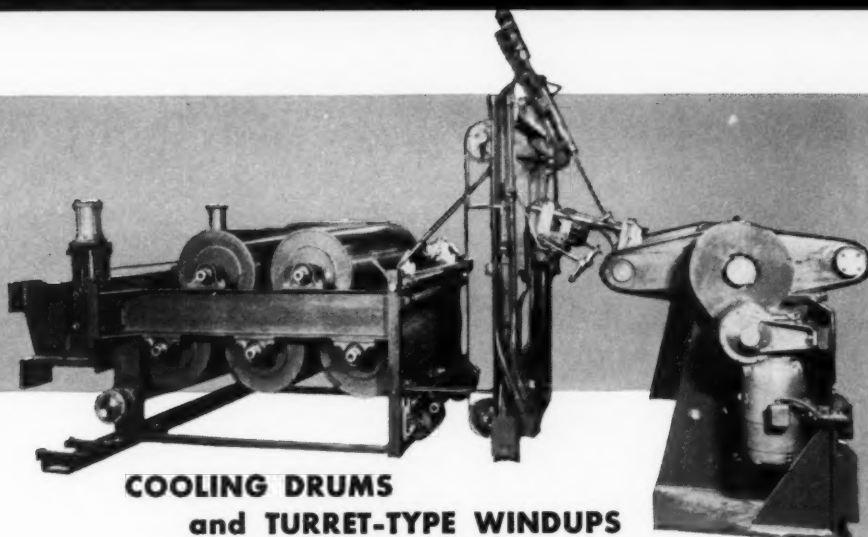
We engineer and build all types of individual production units and complete electronically controlled trains with all accessories for every Rubber or Plastics processing requirement. Our highly specialized engineering and production facilities plus the combined research and technical abilities of United Engineering and Foundry Company, and the manufacturing capacity of eight modern plants, are at your service.

PRESSES

We build all types of presses for the rubber, plastics and plywood industries. Shown is a new 24" ADAMSON UNITED BARREL TYPE PRESS with transfer cylinder. This new press, an exclusive ADAMSON UNITED development, exerts up to 76% more platen pressure than conventional types without change in present hydraulic lines. Stock is transferred into the mold cavities through sprues which reduces cure time and flash trimming to a minimum. Sizes range from 12" through 32" with larger sizes available to specification. Presses Catalog No. 462 on request.



Built to specific requirements from 18 inches to 15 feet in diameter, any length, vertical or horizontal to withstand internal pressures as high as 1000 lbs. per square inch. The Pot Heater shown is a vertical, cylinder-operated breech-door type. Write for Vulcanizer Catalog No. 461.



**COOLING DRUMS
and TURRET-TYPE WINDUPS**

This is a standard type of accessory equipment arrangement for plastics film. It consists of embossing equipment; cooling unit; slitting device; compensator stand and automatic turret windup. The turret windup stand is a center-drive-type with automatic indexing equipment, yardage counter, and adjustable tension control. We design and build entire calendaring process systems including all accessory equipment.

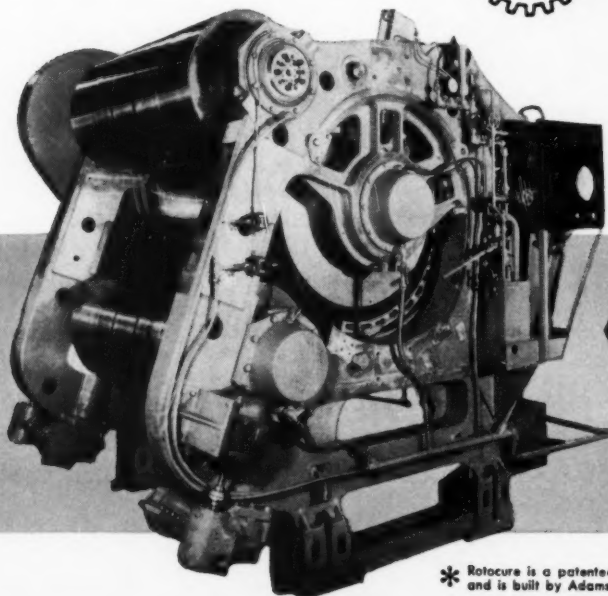
— PRODUCTION UNITS

..... **ADAMSON UNITED**

Wire, phone or write us today. No obligation.

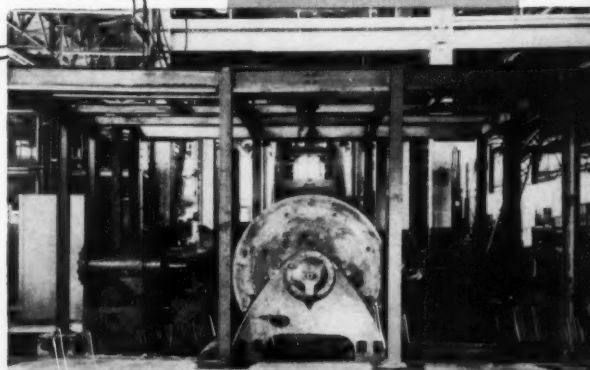
ADAMSON UNITED COMPANY
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SALES OFFICES IN PRINCIPAL CITIES
Subsidiary of United Engineering
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BRAKE and TIRE TESTING MACHINES

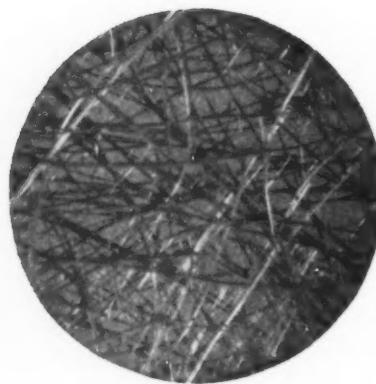
Installation shows an 84" Adamson United High-Speed Jet Airplane Brake and Tire Testing Machine of the inertia type. We have built similar machines as large as 16 feet in diameter for speeds up to 250 M.P.H. and tire loads to 150,000 pounds.



ROTOCURE*

◀ A new machine for the continuous curing of all flat rubber or plastics articles with smooth or designed surfaces. Rotocure increases production through continuous operation without opening, cooling, reheating and closing. It eliminates overcuring or undercuring of the over-lap areas occurring on conventional presses. Roll and belt changes, incident to design requirements, can be made on this new 60" x 80" Rotocure in one-tenth the time formerly required.

* Rotocure is a patented development of Boston Woven Hose and Rubber Co. and is built by Adamson United Co. under a licensing arrangement.



Super strength for plastic moldings

Pittsburgh Fiber Glass reinforcements, made by the direct melt process, provide the *super* strength needed to help make your plastic moldings stronger, safer and lighter. PPG Fiber Glass has exceptional tensile strength, over 200,000 psi in individual fiber glass filaments.

Pittsburgh Fiber Glass reinforcements are provided as roving, or where automatic cutters are not available, as pre-chopped lengths of $\frac{1}{4}$ ", $\frac{1}{2}$ ", 1", $1\frac{1}{4}$ ", 2", $2\frac{1}{2}$ " or 5", as required for direct use with resins.

Why not get all the facts now on PPG Fiber Glass reinforcements or the names of weavers using Pittsburgh Yarns.

Call on the local PPG Fiber Glass representative, too . . . for advice on the best type and size of fiber glass on your next molding job. Contact our executive offices or our district sales offices in Chicago, Cincinnati, Cleveland, Detroit, New York or Washington. Pittsburgh Plate Glass Company, One Gateway Center, Pittsburgh, Pennsylvania.



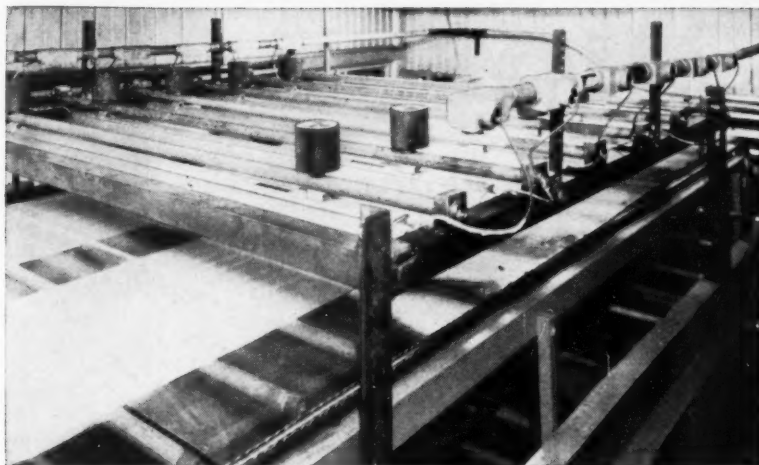
PAINTS • GLASS • CHEMICALS • BRUSHES • PLASTICS

PITTSBURGH PLATE GLASS COMPANY

CHROMALOX

PROFITABLE IDEAS FOR
PLASTIC PROCESSING

Production TIPS



VINYL SHEETS DEHYDRATED AT 22 FT. PER SECOND WITH CONVEYORIZED RADIANT HEATING SYSTEM

While heat, pressure and moisture are often combined in many processing operations, they are a bad team when it comes to laminating a sheet of vinyl between two sheets of glass to make safety glass. In fabricating safety glass the vinyl sheeting must be perfectly dry at the bonding stage to assure cleanness and clearness of the glass throughout its useful life.

That's where Chromalox Radiant Panels enter the picture!

After cleaning and rinsing the vinyl sheets, one large safety glass manufacturer found a ready solution to the problem of moisture by installing a bank of six Chromalox Radiant Heaters to remove excess moisture contents from the sheeting. The heaters were mounted on an angle iron frame above a conveyor belt travelling at 22 feet per minute. The radiant heaters spread an intense blanket of uniform heat across the width of the sheets to reduce moisture content to a very safe one-half of one per cent at the time of lamination.

Bonding failures due to moisture are now eliminated; and the high absorption of the far-infrared heat by the sheeting has increased the drying rate over the former and less efficient method. Too, the compact design of the Chromalox Radiant Heater installation saves floor space and is easily adapted to conveyORIZED production.

Chromalox Application Report No. R-121 covers this interesting application in detail. Send for it today. The report may suggest ways you can improve production and cut rejects in your own operations with Chromalox Radiant Heaters.

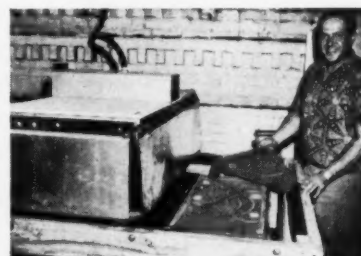
READY REFERENCE GUIDE



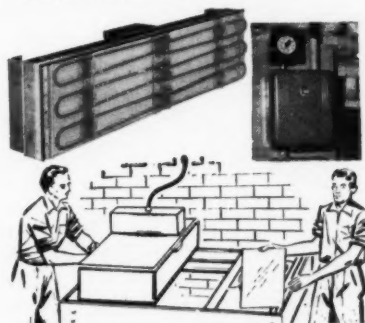
TO CHROMALOX APPLICATIONS IN PLASTICS PROCESSING

Here's a 24-page handbook that shows actual case studies of how Chromalox electric heaters of all types are cutting costs and increasing output in the plastics field. You'll find the handbook interesting and informative. And perhaps you'll also find a solution to a particularly perplexing heating problem now confronting you. Check coupon for your copy of application guide.

VACUUM FORMING FOR A SMALL INVESTMENT



For a relatively small outlay of capital, companies forming plastic sheets by the vacuum process can construct their own molding machines. The secret is in the Chromalox Radiant Panel which is the heating component of the equipment. Radiant panels provide far-infrared radiation that's ideal for uniformly heating plastics of all colors (even white and transparent) prior to vacuum forming. The heat output is adjustable for precisely heating sheets of varying gauges. Vinyl, styrene, cellulose acetate, polystyrene and butyrate have all been successfully vacuum formed by using Chromalox Radiant Panels.



Chromalox Radiant Panel rolls back and forth over two work positions. Input controller: adjusts heat to sheet thickness. Cycle ranges from 10 to 60 seconds.

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Radiant Heating Div.		
7503 Thomas Boulevard, Pittsburgh 8, Pa.		
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Modern Plastics

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MODERN PLASTICS

JUNE 1954

VOLUME 31

NUMBER 10

Achievement in Plastics

In the eight years since the First National Plastics Exposition, America's use of plastics has more than tripled, has now passed the three billion pound annual consumption mark. That in itself is not the true achievement of this industry — it is only the statistical result.

True achievement in plastics is in the development of new and better plastics, in the creation of new plastics products and uses, in engineering and design to upgrade quality and lower costs, in the establishment and use of standards, in the building of public faith through good merchandising.

True achievement in plastics is, in turn, the result of a big, constant, and often arduous job of teamwork — by materials makers, molders and processors, industrial end users, and distributors.

In the following 58 pages we offer a heartening record of but a few examples of this kind of achievement in plastics. Had the editors ten times as many pages in which to present this record, still only a fraction of the field could be covered.





Big Business in Brushes

How and why the world's largest manufacturer of household and personal brushes developed the use of plastics handles and bristles

THERE are three particular points involved in the sale of any brush: a) the purchaser invariably "hefts" the brush to get a feeling of weight and balance, much as she does when buying silverware; b) she has to know that the brush and its handle will be washable; c) if, after months of its service, the brush fails in any particular, the consumer is bound to complain.

These three factors comprise the chief reason why the world's largest manufacturer and distributor of household and personal brushes, Stanley Home Products, Inc., Easthampton, Mass., concentrates over 90% of its personal brush handle and bristle business in plastics. The company's total sales of these kinds of brushes in 1953 was estimated at over \$25,000,000, of which the plastics units accounted for a full \$22,500,000.

Stanley Home Products was established in 1931 as a manufacturer and distributor of household and personal commodities. Through the now-famous "Stanley Hostess Parties" the demand for plastics has grown apace. In 1941 it was decided to replace a wooden handle with a plastic handle on a small twisted-in-wire brush, the handle be-

ing molded with a hole in the end, into which the twisted wire was glued.

Not until the end of World War II, in 1945, was this process refined, although the brush designers' postwar plans involved the increased use of plastics. Then induction heating became usable and a method was devised for heating the twisted wire ends and forcing them into the thermoplastic handle for permanent fix. Out of that, in turn, came the development of other plastics-handled brushes on which the company's present fabulous brush business is based. The line now embraces 29 types of brushes, largely bristled with Du Pont Tynex nylon, and with handles molded of acetate, cellulose acetate butyrate, polystyrene, nylon, acrylic, polyethylene, and—in a single case—a military hairbrush for men fabricated of cast phenolic.

Around 1945, a professional designer was retained to establish a new brush handle design for Stanley Home Products. This design, involving bulk in exterior shape with a slot to provide lightness and ease of hanging, proved most significant; today it identifies the Stanley line.

Plastics used for the handles of a complete line of brushes include cellulose acetate, cellulose acetate butyrate, nylon,





Photos courtesy Stanley Home Products, Inc.

Reasons for use of a particular plastic in brush handle are explained by saleslady at typical hostess party

Two basic operating principles were established at the time the new handle design was perfected. First, the company tested to point of destruction prototypes of all proposed handles in plastics materials, in order to assure complete customer satisfaction. Second, it was decided not to go into the molding or fabricating business, but to use the services of custom molders.

With the new handle design came a revelation in the matter of color selection. Brushes for the

personal use of men and clothes brushes had long been made with rosewood colored handles, a sign of quality; after market tests, the company found that a rosewood-colored mottle formulation of cellulose acetate had the most chance of sales success in plastics-handled brushes. For ladies' brushes a rich ivory color was made to order; for infants' brushes delicate pink and blue tones were developed. The chief products in the complete lines are, of course, the (To page 368)

polyethylene, acrylic, and cast phenolic. Bristles, with very few exceptions, are made of nylon filament





Pioneering Pays Off

Big TV screens demanded big cabinets. Five years ago Admiral proved that they could be molded of phenolic, opened a huge and still growing field

WHEN U. S. television receivers moved out of the laboratory and into commercial production in 1947, many in the plastics industry wondered what impact this infant giant would eventually have on plastics. In its issue of February 1949, *MODERN PLASTICS* put the question this way:

"Will television, whose sensational growth in the past year has been one of the outstanding examples of post-war commercial development, open up a brand new large-scale outlet for molded plastic cabinets? Can table model television sets be expected to appear in increasing volume with plastic cabinets, paralleling the trend in table model and portable radios?"

During the intervening years, these questions have been answered with a resounding affirmative.

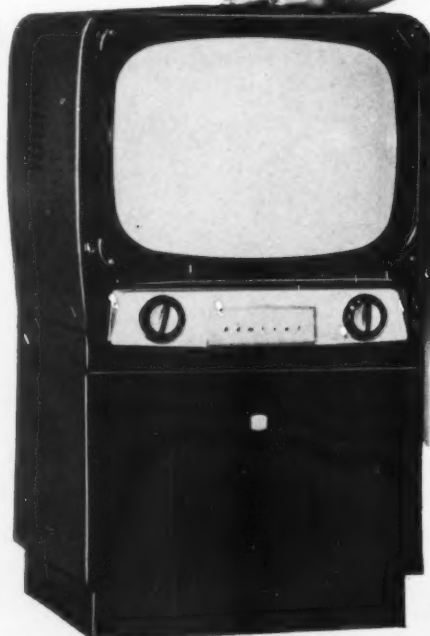
It is estimated, for example, that some 40 million lb. of phenolic material was utilized during 1953 for television cabinets and various other types of housings, with the bulk of this quantity going into TV cabinets. This is in addition to the millions of pounds of other plastics—notably styrene, vinyl, cellulose acetate, and polyethylene—which went into escutcheon plates, picture tube masks, wire insulation, tube end caps, control knobs, tuning

Molded all-phenolic television cabinets have come a long way from the first console-type housing for a 10-in. set, introduced in 1949, to the 1954 giant-size version accommodating a 21-in. picture tube

1949



1954



Courtesy Admiral Corp.



Modern Plastics

Introduction in 1950 of two-cavity compression molding of phenolic television receiver cabinets set new records in production rates. In this operation, 82 lb. of phenolic material (41 for each cabinet) were molded per shot on a cycle of approximately 10 shots per hour. Cabinet at right has been removed from mold, that at left is just being taken off the male portion of the mold



Courtesy Molded Products Corp.

assemblies, and other parts; and it does not include the molded phenolic bases for the vacuum tubes found in every television receiver.

No one company can take sole credit for molded plastic TV cabinets. Practically every major manufacturer now has one or more plastic cabinets in its present line. A great many molders have contributed their sweat, skill, and imagination to furthering this important application. From the technical standpoint, such factors as the availability of larger compression presses, the development of long-flow phenolic molding materials, and the perfection of improved dielectric preheating equipment have played an important part in this industry-wide activity.

The Pioneer

There was, however, one company which pioneered the swing to ever-larger molded cabinets, and which has consistently remained a leader in this field. That organization is Admiral Corp., Chicago, which in April 1948, introduced a 7-in. screen television set having the first cabinet of its type molded completely of plastic material. This cabinet weighed slightly more than 10 lb. and measured 16½ in. long, 9¼ in. high, and 16¾ in. deep. Although Molded Products Corp., which produced this cabinet for Admiral, had previously turned out molded record player cabinets of almost equal weight, the TV cabinet was notable for its

extreme draw, necessary to accommodate the length of the picture tube. It was molded on a 600-ton compression press at a rate of ten shots per hr., using 375 tons pressure. Thirty preforms, weighing a total of 4750 g., were electronically preheated to facilitate the molding operation and speed the cycle. Forty-eight louvers forming the speaker grille were formed by shut-offs in the cavity, while ventilation slots in the sides of the housing were produced by hydraulically actuated side cores. Internal runners along the sides of the cabinet facilitated installation and support of the chassis.

This cabinet had an average wall section of around ⅜ inch. No metal inserts were used, but the part was molded with four cored bosses through which the screen window was mounted to the front of the set. The screen itself marked another important innovation in plastics; it was molded of clear transparent Plexiglas by Amos Molded Plastics. Held to rigid optical standards, this part was a forerunner of the thousands of acrylic (and later, styrene) TV screen windows later used by the industry, some of which measured as large as 19 by 22 in. in size and weighed more than 3 pounds.

Screens Grew Larger

This Admiral TV cabinet was a trail-blazing accomplishment, but greater challenges were ahead. Screens were growing larger, (To page 335)



Mother Never



Molded polyethylene wash basin (Beacon), 4 $\frac{1}{4}$ in. high and 13 $\frac{3}{4}$ in. in diameter, serves in the kitchen for washing silks, woolens, or dishes, is also an ideal baby's bath tub. Flexible basin is light in weight, cannot break or rust

MIXING bowls that bounce when dropped on the floor, butter dishes that can support the weight of a man, transparent containers that never craze or become brittle in the freezer—these are among the “miracle” housewares of the age of plastics.

Mother couldn't ask for anything better—but she's getting it! The quality of plastics housewares on the retail store counters today is at its highest level since the introduction of plastics into the field some 15 years ago . . . and management plans for the future call for radical advances in the development of solidly constructed and well engineered housewares.

Buyer's Market

Perhaps the greatest accolade to plastics housewares is the fact that in today's highly competitive buyer's market, plastics products are selling well. Competition is exceptionally intense, especially in the housewares field, and King Consumer not only expects, but demands, the highest standards for every product purchased. In 1953, every family in the United States carried home 1 $\frac{1}{2}$ lb. of all-plastics housewares. And there are some 40,400,000 families in the country!

There have been many obvious improvements in the design and production of plastics housewares during the past 15 years—thicker wall sections; a more extensive use of molded-in integral supporting ribs; improved color selection; a trend towards the use of the newer, tougher materials for applications that would be subject to more than ordinary abuse; and a trend towards the production of more molded one-piece articles without joints or seams that might open or collect dirt.

Less obvious but equally as important has been the outstanding job done by manufacturers, material suppliers, and distributors in educating the American housewife to the advantages and the limitations of plastics materials. On one level, through the use of lectures, brochures, and pamphlets, the retail store buyer is learning more and more about what plastics materials can do and what they cannot be expected to do—and is passing this information along to his customers.

On another level, informative labeling, store demonstration, and publicity in magazines and newspapers are contributing much toward making the housewife aware of the correct care and handling of plastic products. Leading department stores

Had it So Good!

Plastics housewares first sold well because of their

colors; sales constantly increase because women love them

report that returns of plastics products which have been ruined through mis-use are decreasing at an astonishing rate.

More Expansion

In the past 10 years, applications in the housewares field have increased tenfold; during the same period there have been many achievements in plastics of which both the housewares industry and the plastics industry can feel justly proud. The following examples are but a small sampling from the over-all excellent job being done by the entire industry. They indicate, however, the progress being made in plastics housewares and the reasons why most leaders in the industry feel that the future never looked better!

The present scope of plastics housewares production is reflected, for example, in the line of Lustr Ware products being marketed by Columbus

Curved lip on front edge of rugged molded styrene dustpan (Rogers) fits snugly against the floor



Styrene pitcher by Rogers (above, left) is molded in one piece; polyethylene pitcher by Plastray (above, right) has hinged cover; two-piece styrene pitcher by Columbus (left) has clear top, and opaque bottom part



Molded polyethylene tray (Plas-Tex) is designed to accommodate odd-sized, odd-shaped gadgets



Plastics bread boxes display variety in design and construction. Styrene box by Loma (left) has convenient roll top door . . .



. . . model by Rogers (center) uses hinged cover . . . Plas-Tex model (right) has styrene housing, polyethylene medallion



Courtesy Bakelite Co.

Smooth, waxy surface of polyethylene measuring cup (Plastray) prevents liquids from sticking to the lip

Plastic Products, Inc., Columbus, Ohio. From a modest beginning 15 years ago with a plastic housing for a clothes line reel, more than 125 plastics articles are being produced by that company today. They range from canister sets, mixing bowls, and spice racks to bread boxes, waste baskets, and diaper hampers.

Since much of this growth can be traced directly to acceptance by the housewife of the beauty and durability of styrene plastics, the majority of items in the Lustro-Ware line continues to be injection molded of this material.

Two-Tone Pitcher

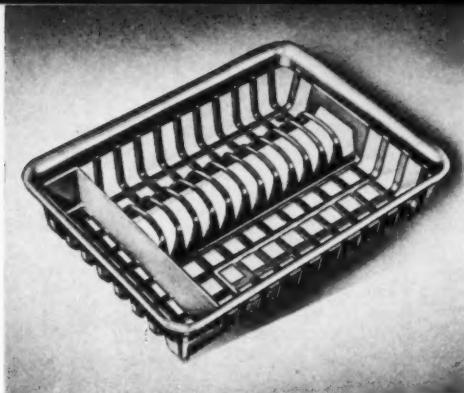
One such styrene product is a new 2½-qt. table beverage pitcher, recently introduced by Columbus. The pitcher is injection molded in two pieces—a crystal top and a colored bottom—which are then joined together. The entire top, including the handle, the elevated curved pouring spout, and an ice retainer trap, is molded in one piece. In common with other styrene housewares, the new pitcher is light in weight, easy to clean, and will not chip or shatter in normal use.

A molded styrene dispenser for waxed paper and



Molded polyethylene waste baskets (Loma) are available in oval shape with a simple cut-out design at the top (left) or in a larger conventional round shape (right). Both models resist moisture, foods, and most chemicals, and can be washed right in the kitchen sink

Courtesy Bakelite Co.



Dish drainer (Columbus) molded of high-impact styrene will not mar the finest china and will not chip or peel



Streamlined styling highlights a 7-piece styrene salad set (Rogers). Contrasting color of pieces harmonizes with modern kitchen decor

paper towels—also a recent addition to the LustroWare line—points up still another advantage of plastics housewares. Since the design of the dispenser requires two curved lids at the front of the unit which can be flipped open to permit easy insertion of the roll of paper, an effective hinge is necessary. This is obtained at minimum cost with simple molded-in lugs which are slipped into matching holes during assembly.

High-Impact Styrene

The introduction of tough formulations of high-impact styrene alloys, supplied by Bakelite Co., The Dow Chemical Co., and Monsanto Chemical Co., among others, has given added impetus to the application of styrene plastics in the housewares field. Claimed to be five times tougher than regular styrene, the alloys are particularly suitable for those household articles that are ordinarily given a rough banging around.

A typical high-impact styrene article—this particular one molded by Columbus using material supplied by Dow—is a dish drainer for conveniently stacking dishes after they have been washed. The rugged drainer will not mar the finest china and

will not chip, peel, or become gummy. Measuring 12 $\frac{3}{4}$ in. wide by 16 $\frac{1}{2}$ in. long by 3 $\frac{3}{8}$ in. deep, the complete drainer, including the flanged rim top and a closed end silverware compartment, is molded in one piece in a single-cavity mold.

Refrigerator Containers

Perhaps the biggest outlet for plastics, particularly polyethylene, in the housewares field are molded plastic refrigerator containers. They can be used over and over again without crazing, cracking, or growing brittle. They are completely odorless and tasteless; their rounded corners make for easy cleaning; and they can be conveniently stacked on top of each other to use every inch of refrigerator space.

Styrene refrigerator dishes currently being marketed by such companies as Columbus, Rogers Plastic Corp., West Warren, Mass., Beacon Plastics Corp., Newton Highlands, Mass., and Alladin Plastics, Inc., Los Angeles, Calif., are available in clear transparent or solid opaque colors and are usually fitted with a molded translucent polyethylene cover that provides an airtight seal. Rogers molds a convenient lip-tab around the edge of (To page 290)



Ephraim Freedman

"I understand that since the First National Plastics Exposition was held in 1946, the industry's volume has tripled. Particularly in home furnishings and housewares where quality counts has your industry's progress been noticeable. While exact figures are not available, I am happy to state that Macy's sales of plastics products and products containing plastics has far surpassed the industry's showing.

"I am also happy to report that, due to our testing and evaluation policies and to the sound ethics and business sense of our suppliers, Macy's in the past eight years has had mighty few complaints about the plastics we have sold. Due to better engineering and proper selection of materials, complaints about plastics are getting fewer all the time.

"With continuing attention being directed towards the creation of standards for end user plastics products, consumer acceptance of plastics is bound to increase, with profit to those who stress quality, adaptability, and durability.

"Congratulations to your industry on this its Sixth National Plastics Exposition."—Ephraim Freedman, Director, Bureau of Standards, R. H. Macy and Co., New York, N. Y.



Today's vinyl drapes, with their better texturing and styling, have shed the low-class label and have now developed a strong appeal to the housewife with more fastidious tastes



'New Look' for Windows

Vinyl film quality, pattern and design, colors, tailoring, have all been radically up-graded, making a bigger market for better drapes and curtains

SCARCELY anything in plastics history has ever matched the sudden rise to popularity and volume production that came to vinyl chloride film in the late 1940's and early 1950's. In four or five year's time, the amount of resin consumed for film—most of it then used for drapes—grew from a few million to almost 80 million pounds. But then, after a peak period in 1951, sales declined. Poor quality material seeped into the market in sizeable quantities and a chaotic price structure in the calendered film field raised havoc with merchandising and cut profits to nil.

Alarmed by what was happening to their industry, producers, converters, and fabricators started a move to upgrade their product. Good high-grade film for drapes and curtains has always been available. Now the industry's idea is to

concentrate on telling the customer how to distinguish between high-grade and mediocre film and in convincing the fabricator that use of the finest grade film is more certain to bring better acceptance by the consumer and more profit to his company.

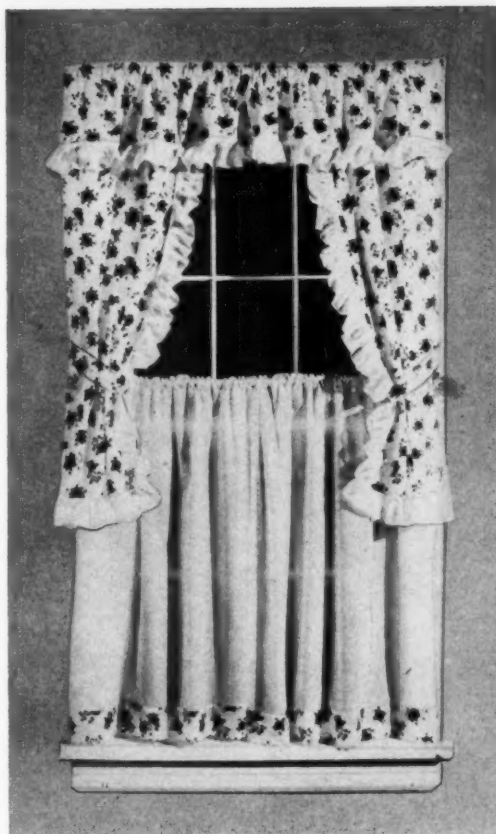
For example, Bakelite Co., a Div. of Union Carbide and Carbon Corp., one of the largest volume film producers, has gone to the public with an extensive campaign to publicize the importance of quality and has instituted an educational program in over 200 retail stores to inform buyers and sales clerks that although various brands of film may look alike there may be a vast difference in the way they perform. Examples are shown to prove that high quality film will win back customers who have become dissatisfied and make new cus-

tomers who didn't know that "plastic" curtains, drapes, shower curtains, cottage sets, and table covers could be so attractive.

Engineered Film

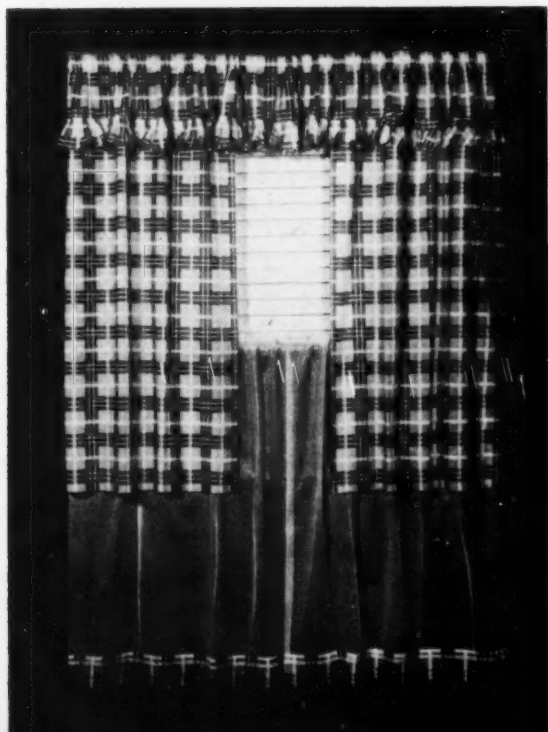
Among other things, the company points out that its vinyl film is "specially engineered" to fit each purpose, that different formulations are necessary for different products such as drapes, rainwear, inflatables, shower curtains, and fishing waders. It tells how film must be tested for heat sealability, pin holes, tear strength, tensile strength, uniform thickness, and color and light stability, to meet the particular requirement for each end product. Bakelite believes that such concentration on details emphasizes the importance of quality to both merchant and customer and must result in upgrading of the product by the entire industry. Drapes take a leading part in this campaign, not only because of their large-volume potential, but also because it was in the drapery field that merchandising losses were most severe.

The idea that vinyl film must be limited to low-cost items is also being cast aside. At a recent style show in California a model displayed a vinyl ensemble of raincoat, hat, umbrella, and handbag whose total cost was between \$55 and \$60. High-styled, quality film made the ensemble well worth the money and certainly raised it far above the bargain basement level to which too many stores have relegated their vinyl materials. Obtaining a higher retail price for vinyl drapes may be a much more difficult task than in the case of the ensemble just mentioned, but there are many producers in the business who believe that it is (To page 288)



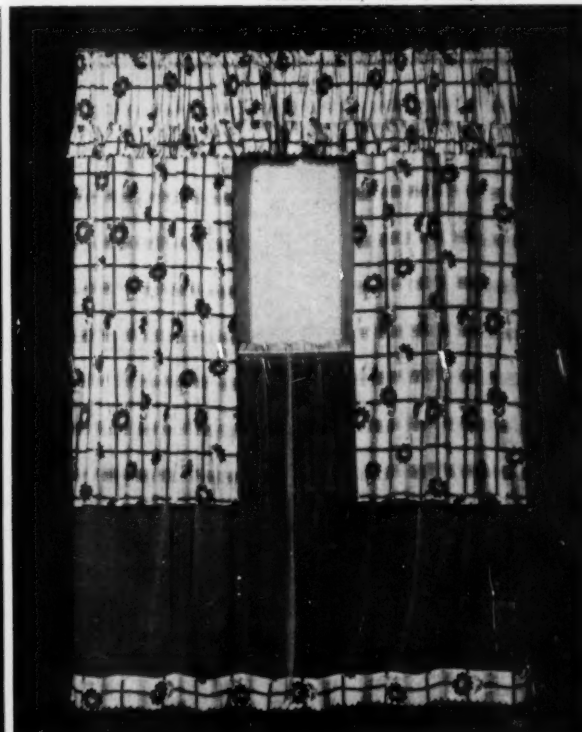
Full valenced cottage curtain, made of vinyl film, dresses up window smartly and in good taste

Vinyl cottage curtains in plaid, that can scarcely be distinguished from fabric material, have won full customer approval



Wider curtain and valence panels and high-style designing help overcome notion that vinyl is inferior curtain material

Photos courtesy Weiss & Klau, Inc.





What Makes Rugged

Improved film, engineered tailoring, stronger seams and welds, strategic reinforcement, all contribute to a better product



Photos courtesy McCoy, Jones & Co., Inc.

Vinyl raincoat with hound-tooth design has deep-cut raglan sleeves

START with a high-quality, properly plasticized vinyl film of adequate gage; style the garments with an eye to fashion as well as practicality; fabricate them to a single standard of uncompromising quality; then merchandise the finished products with pride, vigor, and imagination.

In capsule form, these are the ingredients which, seasoned by experience, have brought market success to the well known Exylin brand rainwear, produced by McCoy, Jones & Co., a division of General American Transportation Corp., Chicago, Ill. Based on Bakelite Krene film, the Exylin rainwear was one of the first vinyl film products to reach the consumer market when the material was introduced in 1940. By adhering tenaciously to the principles outlined above, this line continues to enjoy a position of leadership in the vinyl rainwear field, despite the large number of companies now participating in this huge market.

Prize Winner

In the Fifth MODERN PLASTICS Competition, the Exylin line of vinyl rainwear was cited for an award under Style and Fashion. Here is the wording of that award, as presented in the October 1940 issue:

"Smartly styled with an eye toward good taste as well as practicality, 'Exylin' vinyl-derived wearing apparel—raincoats, smocks and smockettes, and make-up capes—are sleek, smooth, and comfortable to wear. Designed to drape well, in addition to offering protection, the garments are lightweight, waterproof, and resistant to cracking and deterioration. Collars, panels, and other areas that have to withstand considerable handling are made of a heavier gage plastic than that used in the body of the apparel. Reinforced seams give added strength. Available in translucent and transparent colors, both fashionable and serviceable."

Although a quality product in its day, the 1940 Exylin rainwear which received this award was a far cry from the handsome garments making up the line today. The film itself, while basically the same, has been upgraded in quality, uniformity, and color. Improved plasticizers mean even greater flexibility under all weather conditions and a smoother drape for faultless tailoring. An early tendency toward yellowing of the film after extended service has long since been eliminated.

Today's Exylin rainwear, fabricated by improved

Rainwear

methods, is far superior in serviceability to its 1940 counterpart. In 1940, for example, all seams were secured by a specially devised stitching method which rendered them completely waterproof; today, electronically welded, reinforced seams provide even greater durability under rugged service conditions. Nylon stitching, where used, is employed solely for styling purposes, as on front panel and collar bindings. The 4-mil film gage used on the original Exylin rainwear has been retained, with double thickness the rule on collars and other points of wear. Snap closures have been improved and are better reinforced at the points where they are secured to the apparel. Such features as Exylin's "air pump" underarm vents for ladies' rainwear and perforated reinforced vents for men's models have been retained and improved through the years.

Reviewed Each Six Months

The biggest change, however, has been in styling. Today's Exylin rainwear, as contrasted to earlier versions, is much more fully cut for easy fit over outer coats, and tailored to perfection. In fact, the line is reviewed each six months to determine whether new fashion (*To page 375*)



Raincoat has Peter Pan collar; booties are also vinyl

Today's vinyl rainwear for both men and women is smartly styled. It is fully cut to be easily worn over outer coats





Courtesy Lightolier

Attractive wall lamp is supplied with flexible styrene diffuser that softens light, reduces glare, and prevents eyestrain



Light in the

Phenolic "bullet" shades resist heat, won't chip, and are easy to clean. Holes molded into the top of each shade (see center shade) provide added attractiveness and ample ventilation

WHEN in the course of developing lighting fixtures suited to modern living, the interior decorator, the industrial designer, and the illumination engineer combined their talents, plastics moved into the picture.

Light weight, smooth styling, ease of cleaning, glareless distribution of light, and cost economy were advantages brought to the lighting fixture field by plastics, particularly in shades and diffusers.

The sound judgment which many manufacturers in the lighting industry have shown in their selection and use of plastics materials has resulted in consumer satisfaction. With few exceptions, the quality houses in the field that turned to simple molded or fabricated plastics shades for bathroom or bedroom lamps just prior to or during World War II, introduced to the market a plastic product engineered for durability and performance. As materials were improved and as advanced techniques in molding and fabricating became available after the war, these same companies expanded their use of plastics—still maintaining the same high standards of quality that had been accepted by the consumer—to include diffusers, modern opaque rigid shades, and translucent flexible shades.

The plastics materials and plastics processing methods being used by the lighting industry cover a wide range. The lamps and fluorescent

lighting fixtures being made in 1954 by Lightolier, New York, N. Y., one of the country's leading manufacturers, for example, include compression molded phenolic shades; injection molded, extruded, and vacuum formed styrene diffusers; formed and extruded acrylic diffusers; and lamp shades fabricated of vinyl laminate.

Molded Phenolic Shades

Among this group by Lightolier, the molded phenolic shades represent a particularly outstanding application of plastics.

Combining smart appearance with flexible lighting, these modern shades are designed to harmonize with contemporary interior decoration trends. They are available in two styles—a bullet-shaped shade for wall, table, or floor lamps and a visor shade for table or floor lamps—both of which are compression molded of general-purpose phenolic.

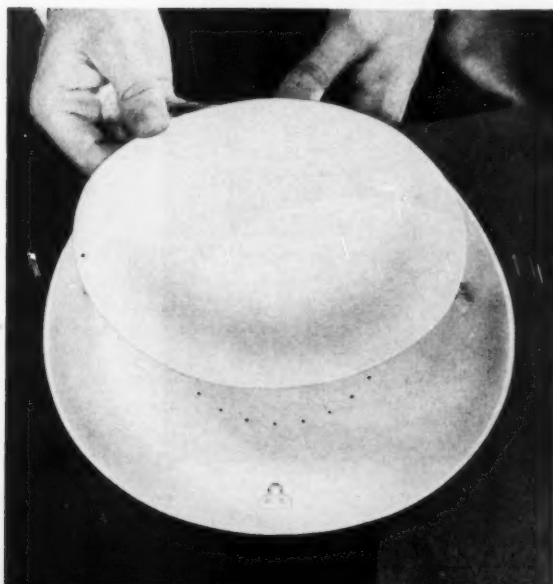
The bullet type shade is composed of two molded parts—the shade proper and a conical switch knob. Twelve vent holes arranged in a circle around the knob are molded into the top surface of the shade. On one side of the shade is a molded-in opening designed to receive the single shaft on which the lamp swivels.

A baked enamel finish, either in ebony black, terra cotta, green, or bone white, is applied to the outside surface of both shade and knob, while

Modern Manner

Contemporary design in lighting fixtures provides

better illumination through the use of many plastics



Courtesy Lightolier

Modern phenolic visor shade for table lamp (above) is designed to direct light down and outward. Wire clips inserted into molded-in raised seats on the inside of shade (left) hold styrene diffuser in place

the inside of the shade, with the exception of a 1-in. band around the bottom edge of the shade is painted white. This band, in the original black color of the phenolic, reduces glare.

The second phenolic model being marketed by Lightolier is a visor-type shade that is also mounted on a swivel. It is designed to direct light down and outward, thus shielding the eyes of any person on the side of the room opposite the lamp.

A hole is molded into one end of the visor shade to accommodate the ring or swivel on which the shade is mounted. Directly above this hole on the inside of the shade is a molded-in seat and slot into which one end of the socket strap is inserted. The other end of the strap is attached to the swivel shaft. Three other seats, each with a pair of molded-in holes, are molded into the sides of the shade to accommodate metal clips which hold a styrene diffuser in place. Molded-in vent holes, also arranged in a circle on the top of the shade, provide ample ventilation as well as an attractive sparkling effect when the lamp is lighted.

Thick Wall Sections

In addition to the obvious economies in production and assembly which the molded phenolic shades represent, there are many advantages derived from the physical properties of the material. The tough, heat-resistant shades won't singe fingers no matter how long the light may be on, won't chip, won't transmit light, and are easy to clean. Despite the thick wall sections of the shade—an important selling point—the model is light in weight. The bullet shade, for example, which has a wall thickness of $\frac{3}{8}$ in., weighs, complete with the molded phenolic knob and the metal swivel seat and socket, only about 10 ounces.

A more conventional line of equipment is offered by Lightolier in the form of diffusers for fluorescent lights. These diffusers are generally either formed in one piece of acrylic sheet, injection molded of acrylic, or extruded of styrene, depend-

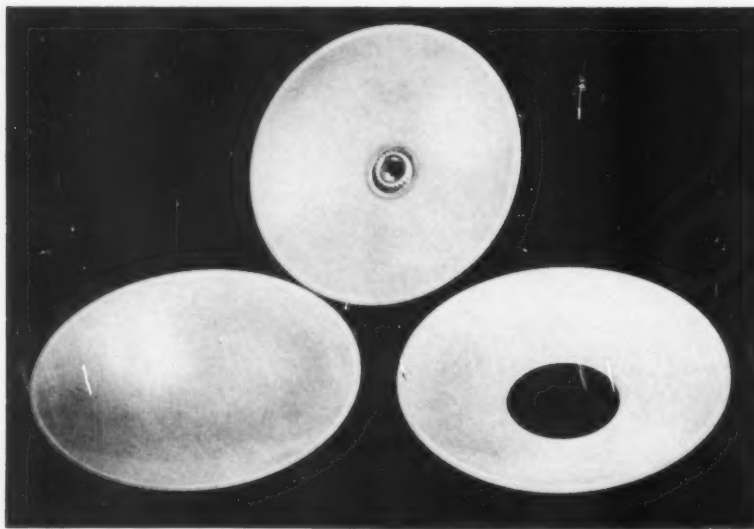
ing upon cost considerations and the end applications to which they will be put. Several types of acrylic diffusers are also custom extruded by Lightolier on special order.

The rectangular one-piece acrylic diffusers are available in a wide variety of sizes and are used principally as shields for fluorescent lighting in commercial and industrial applications. Since the diffusers are fairly shallow in depth, they blend cleanly into the ceiling line, preserving the architectural integrity of the area. The acrylic shield uniformly diffuses light through its sides, ends, and bottom, and can be snapped in and out of position with only finger-tip pressure. The one-piece enclosure is easy to clean and will permanently retain its dimensions, whiteness, and light transmission.

Styrene Diffusers

For residential applications, the extruded styrene fluorescent light diffuser has proved most popular. Like the acrylic models, there is a wide variety of shapes and sizes among styrene diffusers, including a circular mirror and bathroom unit, a rectangular overhead light, and corrugated ceiling lights. The majority of these flexible shields are extruded by Lightolier in one piece with an overhanging lip along the top edges. When installing the diffuser, the edges are simply snapped into place in the frame. Once in place, the lip serves as an integral hinge which permits the diffuser to be swung open for easy cleaning. Complicated metal snaps and expensive hinges are therefore unnecessary.

To soften the light emanating from incandescent portable lamps, thereby reducing glare and preventing eyestrain, Lightolier installs an injection molded circular styrene diffuser directly below the bulbs in many of their lamps. In some models, spring clips mounted in the sides of the lamp shade hold the diffuser in place. On other models, a circular opening is molded into the (To page 326)

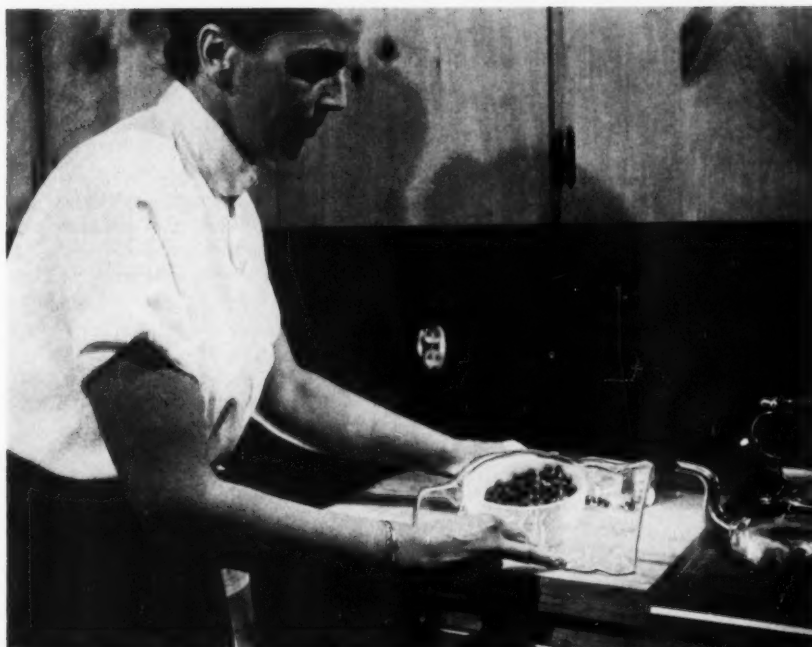


Design of injection molded styrene diffusers for incandescent lamps includes (left to right): solid diffuser; diffuser with molded-in opening to accommodate a single socket; and diffuser with large opening, about 5 in. in diameter, to easily accommodate triple-socket lamp

It Clings to Itself

Saran film, first used in wrapping metal parts

for the military, now becomes a home kitchen tool



Transparent bowl cover is conveniently made with saran film by simply pressing a sheet of the film around sides of container

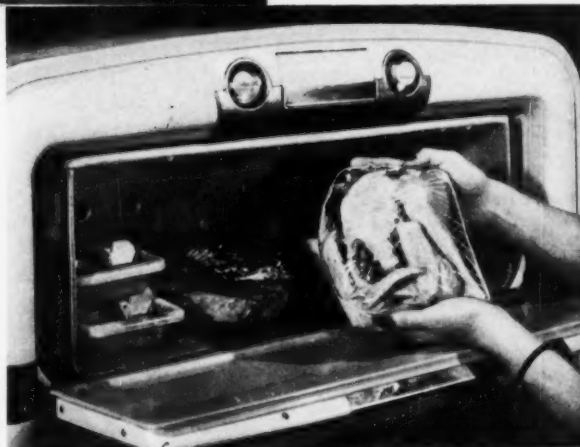
Resistance to moisture and greases make saran film ideal for wrapping meats and other foods for storage in the freezing compartment of home refrigerators or in deep-freezers

THE inevitable piece of string and the elusive rubber band have fallen upon evil days. Under the impact of plastics progress, a segment of their stronghold in the kitchen is crumbling, their tenacious grip as a necessary accessory to household wrapping materials is weakening.

The reason? Saran film, the new wrapping material that clings to bowls, pans, dishes, and to itself, without requiring strings or rubber bands to hold it tight. Although brand new in its application as an all-purpose household protective wrap, saran film—thanks to its clinging tendencies and its many other advantages—has already met with enthusiastic consumer acceptance and is rapidly becoming an important kitchen favorite.

Metal, Then Food

In developing into a household wrapping material, saran film has followed a devious route. Originally it earned a name for itself during World War II as a protective wrapping for metal parts. By the end of the war, however, the impermeability, transparency, and toughness properties of the film had attracted the attention of commercial packers of meat, dried fruits, cheeses, and baked goods. They found in saran film a packaging material that would ensure the customer receiving a



Courtesy The Dow Chemical Co.

product weighing and tasting the same as when it left the packing plant. Within a few years after the close of World War II, commercial food packaging had developed into the major outlet for saran film.

Taking a hint from the satisfaction of the commercial packer with the material, The Dow Chemical Co., producer of the film, made the obvious move of introducing saran film in convenient-to-use household roll form for the kit- (To page 331)



Vinyl on the Inside

Setting the pace for future automobile upholstery

and trim, Chevrolet uses vinyl to create

an interior that is beautiful, washable, and scuff-proof

THE consumer advertisement reproduced here created considerable excitement in both plastics and automotive circles. The announcement that at least one model of the world's most popular automobile is being offered with an all-vinyl interior was electrifying, because Chevrolet has a reputation of extensive testing before specifying materials and because this model presages an obvious trend toward increased use of vinyls in all automotive interiors.

In Chevrolet's Delray Club Coupe, the seats, sidewalls, and headlining or ceiling are all made of fabric-backed vinyl.

Approximately 12 running yards of 54-in. wide material goes into each car, duo-tone trim effect being achieved by the use of harmonizing light and dark colors especially formulated to the specifica-

tions of the Fisher Body Div. of General Motors Corp.

Fisher Body purchases this supported vinyl material from several sources, and it is delivered to the company's Cleveland fabricating plant where it is cut and sewn into upholstery and trim sets, then shipped to assembly plants located across the country. The chiefs of Fisher Body's trim departments found no difficulty in adopting vinyl-coated fabric to the standard cutting and fabricating equipment used for other materials; nor were difficulties found with vinyl at the assembly plant.

Can Take Abuse

Chevrolet's switch to vinyl upholstery and trim in the Delray model was not the result of a wish to be promotional. The simple fact is that, particu-



Photos courtesy General Motors Corp.

Water from swimmer's wet bathing suit will not mark or seep through car's vinyl upholstery or interior trim

Car seats, upholstered in fabric-backed vinyl, are waterproof, easily cleaned, wear well, and make car interior colorful

NOW HERE'S A NEW MODEL
AS SENSIBLE
AS IT IS *Smart!*



CHEVROLET'S NEW DELRAY CLUB COUPE

ITS BEAUTIFUL, PRACTICAL INTERIOR IS ALL NEW AND ALL VINYL
WITH ALL THE KNEE ROOM OF A 2-DOOR SEDAN

This Delray Club Coupe combines all the comfort and sportiness of a sport model with an interior that's designed for everyday family use. Seats, sidewalls, even the headlining, are all of soft, lustrous vinyl in color treatments that harmonize with the exterior color of your choice.

And this new interior is just as durable and practical as it is beautiful. The vinyl is easily washable and amazingly resistant to scuffing and wear. You don't have to worry about little feet on the seats or the things that little hands might do. And for grown-ups, here at last is a coupe that provides all the between-seat knee room of a 2-door sedan!

Along with these special features, the Delray Club Coupe offers you all the advantages of any new Chevrolet model. New power that gives you finer performance with important gasoline savings. New beauty and luxury in Chevrolet's Body by Fisher—the only Fisher Body in the low-price field. And, if you like, your Delray Club Coupe can be equipped with all the automatic power features you want as extra-cost options.

The Delray Club Coupe is only one of the wonderful new Chevrolet models that make up the lowest-priced line of cars. Come in, look them over and choose your favorite.



MORE PEOPLE BUY CHEVROLETS THAN ANY OTHER CAR!

SEE YOUR CHEVROLET DEALER FOR ALL YOUR AUTOMOTIVE NEEDS!

Today's car maker points with pride to the use of vinyl in his automobile for seat upholstery and interior trim

larly in the popular price range, today's automobile interior must take ten times the abuse accorded to its ancestor of only a decade ago. Attack by kids and dogs and sand and water must be withstood by the toughest, most easily cleanable, most abrasion-resistant materials that can be found. Fabric-supported vinyl was a sound choice, especially since it may be had in such a wide variety of colors and embossed effects.

Sales of the model over the past four months are declared by Chevrolet officials to be more than satisfactory and to reflect the soundness of their

decision to use all-vinyl interior trim and to promote that use through advertising and publicity. Already the automotive industry grapevines advise that 1955 models of several cars will include similar features. This, to the plastics industry, means a great deal. If only 25% of all American passenger cars produced in a year (6,140,000 in 1953) were given the vinyl trim treatment, 18,420,000 yd. of vinyl upholstery material would be used in this one application!

No wonder this Chevrolet ad caused so much excitement!



New Switch on Spouts

Dual-function polyethylene closure replaces lead spout and threaded cap, making completely safe seal for lighter fluid container

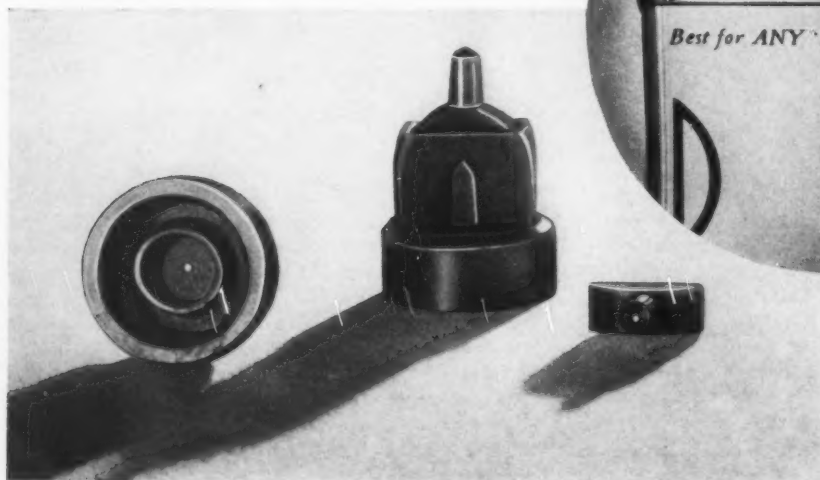
MOLDED plastics caps and closures are used by the millions every year. The array of products involved is almost limitless, ranging from such everyday items as toothpaste, hand lotion, medicinal preparations, cologne, and shaving cream to hard-to-handle chemicals in heavy duty shipping drums. In the fabulous new field of aerosol containers, plastics caps and dispensing valves are used almost exclusively. Caps and closures have long since become an important outlet for phenolic, urea, styrene, and polyethylene, since they offer integral color, chemical resistance, efficient sealing of contents, design freedom, and a degree of convenience almost impossible to attain with non-plastics caps.

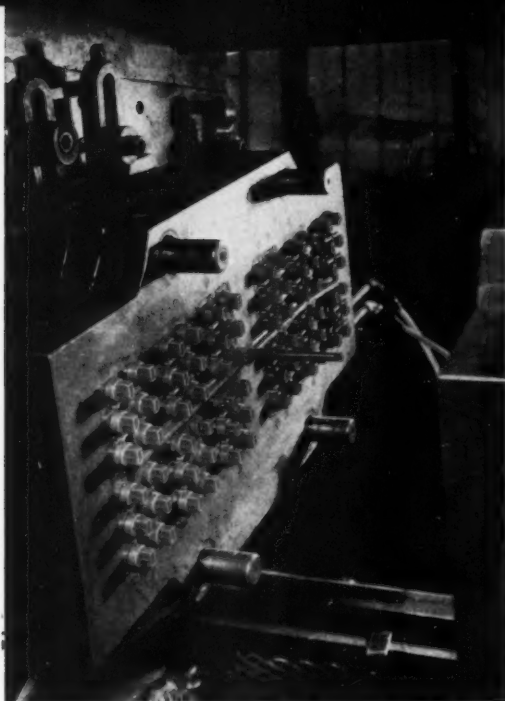
The advent of polyethylene in the postwar period, and the improved supply situation of this exciting new plastic, opened the way to entirely new concepts in the closure field. For example, with polyethylene it is possible to mold dual-function closures having an integral cap which cannot be lost,

and requiring no assembly operation. That part of the cap which does the actual sealing is connected to the main body via a thin web of polyethylene which may be flexed thousands of times without breaking. This unique resiliency of polyethylene also permits the closure plug to be molded with a snap-in fit for effective sealing. Since polyethylene caps may be molded with pronounced undercuts, lugs, etc., and stripped hot from the mold without complicated unscrewing mechanisms or other costly die features, more and more manufacturers are studying the possible application of this versatile plastic to their closure problems.

Such properties of polyethylene have been effectively utilized in a completely new type of closure adopted by Ronson Art Metal Works, Newark, N. J., for use on its 4-oz. cans of Ronsonol lighter fluid. For many years, this can carried a lead spout having a small internally threaded cap. To dispense the fluid, the user had to unscrew the cap, then carefully cut off or pierce

Combining function of closure and dispenser, polyethylene spout for lighter fluid can is molded in two parts—body and swivel turret with nozzle. To dispense lighter fluid, nozzle is moved to vertical position; when inclined to either side, turret acts as an effective seal





Spout bodies are produced in 72-cavity mold on 22-oz. injection machine, need no post-molding finishing



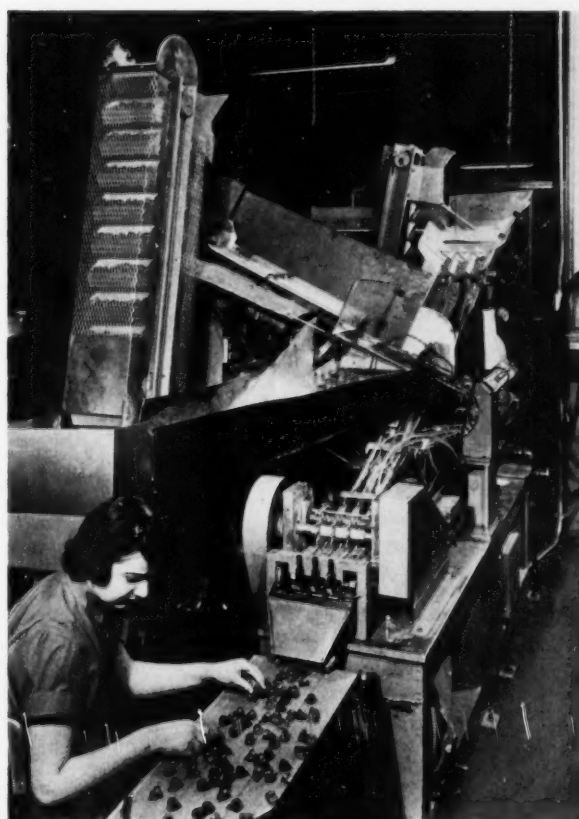
Turrets with cored nozzles are molded in 92-cavity mold on 8-oz. machine. Here operator removes shot

the sealed end of the spout. This arrangement was inconvenient at best, and even after the spout had been punctured it was easy to lose the cap so that the can could not be closed to prevent rapid evaporation of the product. Bending of the lead spouts in shipping presented an additional problem.

Easy to Open and Use

After extensive laboratory, shipping, and market tests, Ronson has now adopted a specially designed plastic spout, molded of red polyethylene, which overcomes these difficulties and for the first time makes cans of lighter fluid easy to open and use without recourse to pins, scissors, or other implements. Ronson's new Switch-Spout also seals the fluid securely and contains no removable parts to lose. Sales of Ronsonol with the new type spouts began recently on the West Coast and the unit is now in national distribution, completely supplanting the old-type lead spout and cap.

The plastic spout consists of an outer housing, circular at the base and tapered to a hollow rectangular section at the top, and a flat circular disk with an integral cored nozzle which can be inserted directly into the filling hole of a lighter. Held firmly in the semi-circular cavity of the base, the spout may be switched to either end of the slot to shut off the flow, or moved to the center position when fluid is to be dispensed from the can. With the spout in the center position—and only in this position—the opening in the spout lines up exactly with that through the base of the cap, and fluid is free to flow out. With the spout closed, even sufficient pres- (To page 362)



Courtesy Mills Plastic Div., Continental Can Co.

Over-all view of automatic spout assembly machine. Complete units are visually inspected (foreground)



Photos courtesy Crosley Div., Avco Mfg. Corp.

Molded styrene water container fits into back of refrigerator door; has swing-out spout for easy filling, transparent window to show water level

Refrigerator Revolution

A combination of new materials, new engineering, and new design has provided new value, new beauty, new efficiency for household refrigerators

MODERN refrigeration methods have completely revolutionized food storage in the home; a parallel and equally important revolution has been taking place in the materials used in components for refrigerators. Some 15 years ago, only a handful of plastics parts such as terminal blocks and control knobs could be found in mechanical refrigerators. By contrast, today's refrigerators contain many pounds of plastics—30 lb. or more in some models. Of particular significance is the fact that plastics usage per refrigerator continues to increase as designers and engineers search for and perfect new applications.

Although styrene is indisputably the "work-horse" plastic of the refrigeration industry, a number of other materials also contribute to the beauty and serviceability of modern refrigeration equipment. Among the most frequently used are acrylic, phenolic (molded and laminate), nylon, vinyl, and polyethylene. Fibrous glass-polyester laminate, still something of a "dark horse" in refrigerator construction, appears to have great capabilities and is beginning to grow in use.

Standard Applications

Many applications of plastics are now virtually standard throughout the refrigeration industry, with variations in design treatment by different manufacturers. Molded styrene breaker strips or

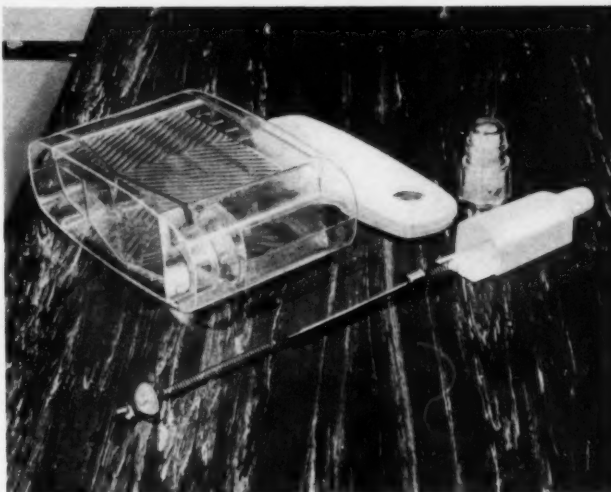
frames, styrene or phenolic laminate door liners, three-dimensional acrylic medallions, handle inserts and other decorative parts, nylon door latch rollers, vinyl-sheathed wiring, and molded styrene meat compartments, baffle plates, vegetable crispers, butter keepers, door shelves, control knobs, and freezer compartment doors are examples of components which have gone over virtually 100% to plastics.

However, progress is continuing in new directions. As an example, styrene has supplanted glass containers for catching defrost water, giving the housewife a lightweight receptacle much less subject to thermal or mechanical shock, and much easier to handle. One manufacturer is now using a molded elastomeric vinyl drain rail which catches defrost water and carries it through the back wall of the cabinet, where it passes down a tube to a shallow pan beneath the appliance (see *MODERN PLASTICS*, Feb. 1954, p. 110). In its push-button defrost models, Crosley utilizes a molded styrene baffle plate beneath the freezer chest which retains defrost water and freezes it until such time as the homemaker chooses to empty it.

To date, the nearest approach to the 100% plastics refrigerator is the Servel Wonderbar (see *MODERN PLASTICS*, Nov. 1952, p. 111). This totally new concept in refrigeration is a small portable refrigerator for use in offices, hospitals, boats,



Butter keeper, molded of styrene, with adjustable temperature dial, holds the dairy product at spreading temperature



Coffee keeper components include (clockwise) styrene container and top cover, silica gel container, and spring-loaded plunger

nurseries, recreation rooms, etc. Essentially, it consists of an inner food cabinet of impact styrene and a phenolic outer cabinet.

Formed styrene alloy sheets and molded glass fiber laminates may also be expected to make a strong bid for many components now made of metal or other types of plastics. Admiral Corp., in some of its newest type combination freezer-refrigerators, is utilizing a complete freezer compartment liner molded of fibrous glass-polyester laminate. This part weighs 10 lb. and measures 25 $\frac{3}{4}$ by 18 $\frac{13}{16}$ by 17 inches.

The constant striving for greater housewife convenience and more operating efficiency underlies many of the new plastics applications in this field. Polyethylene, for example, proved to be an ideal material for flexible ice-cube trays which could be easily emptied simply by twisting. The newest development along this line is a polyethylene tray with a large number of small compartments, which actually yields crushed ice when unloaded. International Harvester uses large molded polyethylene containers for storing certain types of foods in its home freezers; they are light in weight, pleasant to the touch even at low temperatures, and unbreakable in normal use.

Roll-Out Shelf Bearings

Molded nylon is now virtually standard for door latch rollers. It requires no lubrication and will provide years of trouble-free service. These same qualities find molded nylon moving into new applications such as bearings for roll-out shelves, now being featured by many manufacturers, and for revolving shelves used in some of the newest General Electric models.

With virtually every refrigerator manufacturer now making use of door shelves and compartments, many innovations in door panel treatment have appeared. From the production standpoint,



Roll-out shelves, gliding on molded nylon bearings (see arrows), make stored food easily accessible

one of the most significant developments along this line is an inner door panel introduced by Admiral in which the bases of the door shelves, butter keeper, and egg storage compartment were molded integrally in the liner, eliminating much later assembly work. Thermostatically controlled butter storage compartments in the door are now common, and special molded plastic storage sections for bacon, cheese, etc., within easy reach further emphasize the imaginative use to which plastics are now being put in this field.

Low-temperature resistance, ease of cleaning,



High-impact molded styrene panels hold food packages and cans neatly in place in upright freezer door

freedom of design, and related advantages also make possible such applications as the molded styrene dispenser-type rack for canned juices now found in certain G-E refrigerators. This rack is so arranged that when one can is removed from a slot at the bottom, another drops into place ready for delivery. This same principle, on a much more advanced scale, is followed in the new "Stor-Mor" freezers built by Amana Refrigeration, Inc. Through the use of adjustable molded impact styrene food holders that may be snapped into the inner door panel in different positions to fit packages of various sizes, these freezers will hold up to 90 lb. of food—116 packages and cans—right in the door. When the bottom package is removed, another moves into place, readily accessible. This arrangement provides automatic inventory control and eliminates the need for record keeping, since the first foods stored are also the first served.

Several refrigerator manufacturers, including Hotpoint and Deepfreeze, now offer "swing-out" type meat storage compartments which permit the housewife to make meat selections from the refrigerator without disturbing other contents of the food compartment. In some instances, this special storage section may be conveniently removed from the food cabinet to make room for watermelons or other bulky items. The compartment is vacuum formed, the lid molded, of high impact styrene.

Accenting the convenience approach is a new feature just introduced by both Crosley and Deep-

Use of one-piece, high-impact styrene breaker frame in upright freezer saves material cost and assembly time



Photos courtesy Amana Refrigeration, Inc.

Food holders are adjustable, making it possible to accommodate different sizes of frozen food packages





Curved styrene swing-out meat compartment puts meats within easy reach, allows full use of adjacent space

freeze in some of their 1954 model refrigerators. Both these companies have now made it possible to obtain cold water and other beverages directly from inside the unit without opening the door, by means of supply tanks on the back of the door connected to a self-closing tap on the front. This is not only much more convenient for the user, but also more efficient since it reduces the number of times the door must be opened and minimizes frost accumulation and loss of cold.

Cooled-Water Tap

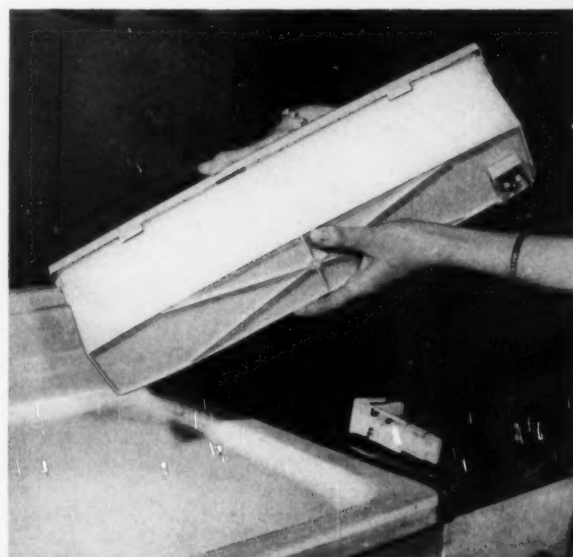
Chilled drinks flow readily from the Deepfreeze Aqua-Tap dispenser. A glass may be filled merely by pressing it against the control valve, located at a height easily reached by small fry.

Most parts of the Aqua-Tap, as well as the supply tank, are molded of high-impact styrene. The tank is a modified version of a door crisper bin. By designing the valve bracket housing as an integral molded part of the tank, Deepfreeze saved costs as against the alternative of having separate fittings made. To prevent splashing, the tank has an integral baffle plate and a rubber gasket on its hinged cover. The selection of styrene for this unit was based not only on its strength and economy but also upon the fact that it is odorless, tasteless, and resistant to attack by fruit acids and alcohol.

In the 1954 Crosley Shelvador refrigerator, the water tap is centered on the door, near the top, and connects through the door to a 3-gal. removable water chiller tank on the inside. The large styrene tank may be filled with a pitcher without removing it from the door or may be carried to the faucet for cleaning (Continued on page 303)



Cool liquids dispensed through freezer door are kept in molded styrene container built into the door

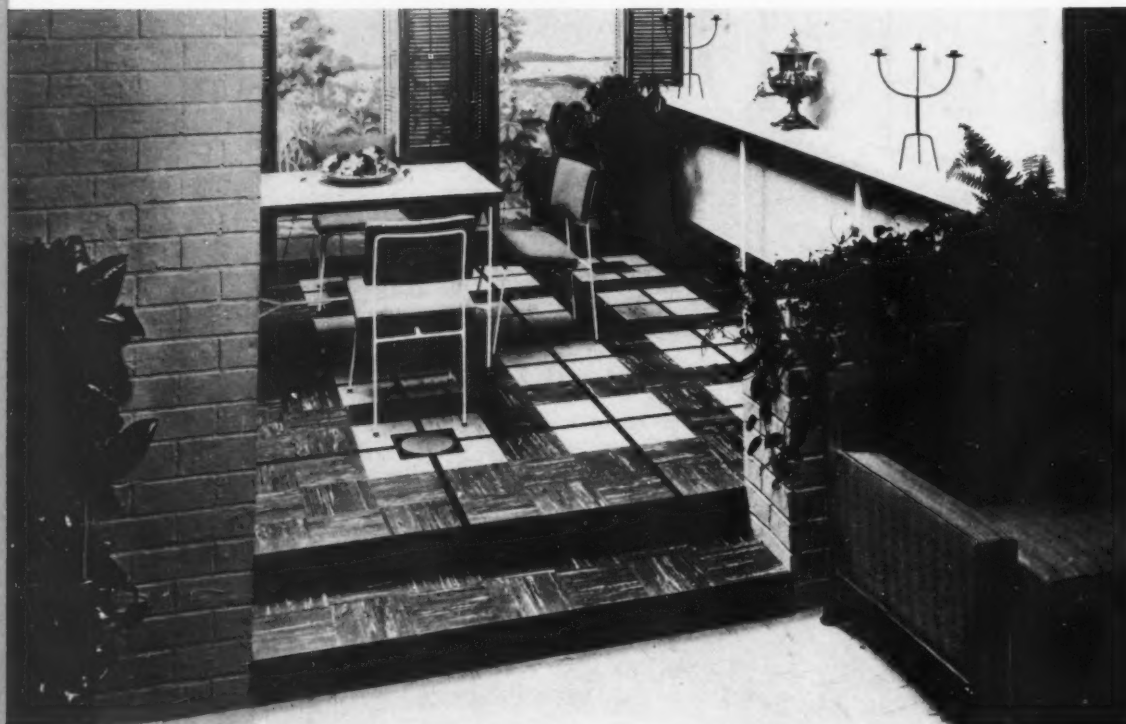


Photos courtesy Deepfreeze Appliance Div., Motor Products Corp. Close-up of cool-liquid tank shows bracket assembly and molded-in valve housing; spout is on counter top



Vinyl Takes the Floor

Non-skid tile, resistant to grease, oil, abrasion,
and fire, is made by combining vinyl and asbestos



Photos courtesy Kentile, Inc.

Vinyl-asbestos tile flooring adds charm and utility to dining alcove of modern home. The tile, which resists fire and abrasion and can be easily cleaned, makes possible a wide range of decorative designs

TO AN average home owner, justly proud of a new vinyl floor, it might come as a big surprise that the first installation of vinyl flooring made in the United States is still in good condition after being trod upon by hundreds of thousands of people for 22 years. This vinyl flooring was laid in the Bakelite Exhibit at the Chicago World's Fair in 1932 and is still giving excellent service today in another location.

The durability of vinyl flooring has never been disputed, but progress in obtaining large sales volume has been slow and tortuous until the last two or three years when vinyl resin sales for use in floor tile suddenly shot up from a few million lb. annually to 11 or 12 million lb. in 1952 and an amazing 22 million lb. in 1953. Market analysts predict that the figure may go to 60 or 75 million

lb. within the next five years. The area of flooring represented by that amount of resin would be 140 or 150 million sq. yd., which is somewhere near 20% of the total hard floor covering market in the United States.

Vinyl-Asbestos

There are various types of vinyl floor covering on the market, but it is doubtful that any of them have made such rapid sales progress in the last two or three years as the vinyl-asbestos type. The compound contains from 12 to 18% vinyl resin, depending upon who is making it, and the balance is filler, plasticizer, stabilizer, and pigment. There are at least six floor covering manufacturers now producing vinyl-asbestos tile. The photographs herewith show KenFlex, a product of Kentile, Inc.,

Brooklyn, N. Y., one of the pioneers and largest producers of this type of material.

Joseph L. Kolcyski, vice president of Kentile, points out the various difficulties that had to be overcome before vinyl-asbestos became a leader in its field.

When vinyl tile came on the market in fairly sizeable quantity after the war, one of its finest sales appeals was clarity of color. But unfortunately those first colors were unstable—they faded or turned darker when exposed to sunlight. Combination colors resulted in weird effects. Those early tiles also lacked dimensional stability. A 9-by 9-in. tile shrank to $8\frac{7}{8}$ by $8\frac{7}{8}$ inches. The shrinkage left gaps through which the adhesive would work up, and the crevices also became catch-alls for dirt. It was impossible to get the dirt out.

Another disadvantage was a relatively soft surface that made the tile susceptible to scratching; dirt collected in the tiny hairline scratches.

Better Pigments

Kentile tried hundreds of pigments over a long period of years before it found those that would neither fade nor darken. Two years were required to find the right formulation of vinyl and asbestos that would be proof against shrinkage. The present tile is not only resistant to shrinkage but when slightly heated is extremely pliable, making it so easy to work that thousands of women are laying the tiles in their own homes themselves.

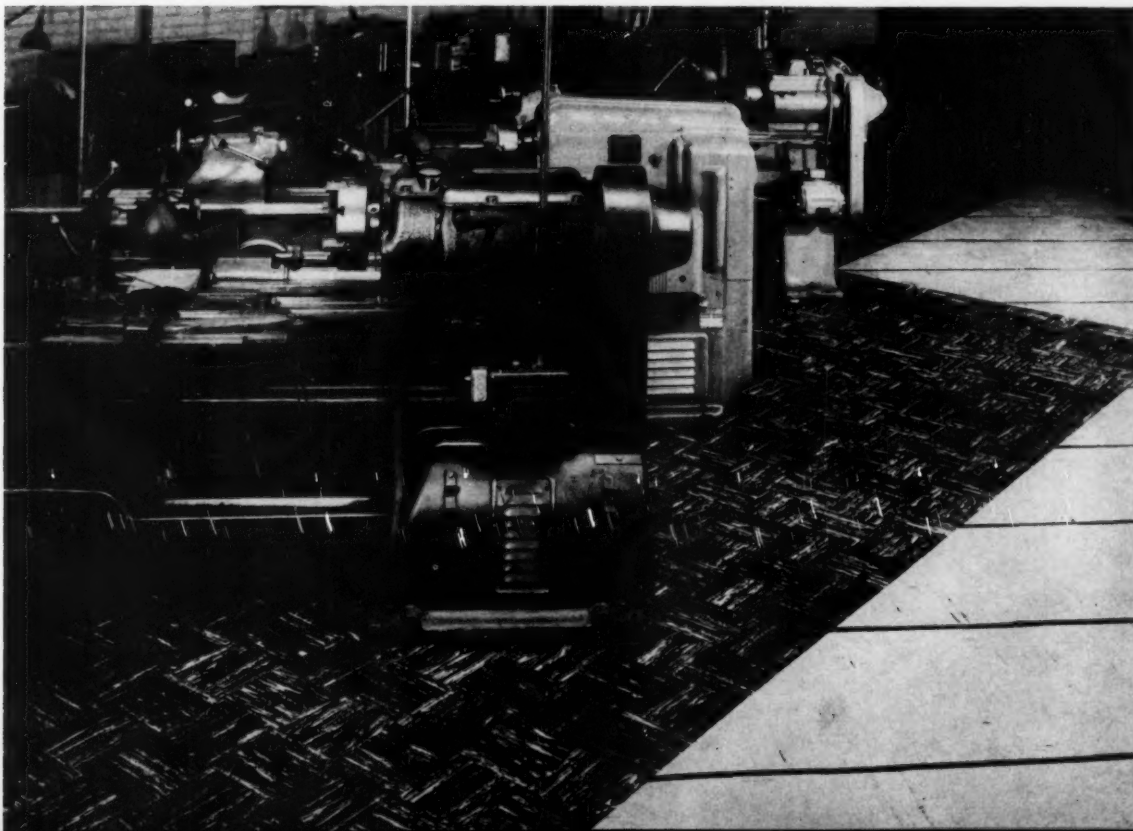
Today the hard, smooth surface of the tile is so resistant to oil, grease, alkali, gasoline, turpentine, and practically all kinds of dirt and stain that they require only infrequent cleaning and then only soap and water is needed. Frequent waxing is unnecessary but an occasional treatment will enhance the tile's beauty.

In 1940, a trial job was laid in front of the elevators of the Union Carbide and Carbon Bldg. in New York. Countless visitors and 2800 employees use the elevators and walk on the flooring daily. It has now been tramped on over 61 million times with no sign of wear. After the 50 millionth tramping, Kentile decided that the proof was good enough and released their vinyl-asbestos tile to the market in 1953 under the name of KenFlex.

Resistance of this tile to slipping and fire is in its favor for institutional and commercial use. Schools, theaters, and stores find it highly suitable for their use. Supermarket chains are now using it to replace worn flooring and in new stores.

Use of vinyl-asbestos tile is spreading rapidly from commercial to residential construction and remodeling. The housewife likes its bright color and the ease with which it can be installed and kept clean. Kitchens, recreation rooms, playrooms or nurseries, bathrooms, and hallways are natural locations for vinyl-asbestos tile. With the current trend toward less use of wall-to-wall carpeting and of more color in home decoration, vinyl is increasingly being adopted for use in living, dining, and bed rooms.

Industrial plants are getting a new look through the use of vinyl-asbestos tile. Grease and dirt from heavy machinery cannot penetrate the colorful surface of the vinyl floor and are readily wiped up





A Challenge to Junior



Courtesy American Metal Specialties Corp.
Miniature carpet sweeper housed in durable styrene case actually picks up dirt



Courtesy Hercules Powder Co.
Colorful turtle shell molded of cellulose acetate adds eye appeal and extra play value to pull toy

Molded styrene parts are easily assembled with screws into realistically detailed model sports cars
Courtesy Ideal Toy Corp.



Today's larger, tougher plastics toys, made of high impact and even reinforced materials are marvels of design and durability

BESIDES setting a record for size and variety, the 1954 crop of plastics toys seems certain of setting a record for value—both in high quality construction and in increased play interest.

The development has been a natural one in view of the huge market increase that the entire toy industry has experienced in the past ten years. Births in 1953 of close to 4 million brought the number of children under six years of age to an all-time high—65% greater than in 1940. The total number of children under 15—the age at which the child usually outgrows his toys—also reached a peak in 1953 of 43,800,000.

Coupled with this increase in potential custom-

ers for plastics toys has been the increased consumer appreciation of the safety, durability, and play appeal of plastics toys.

The result—one of the best years in plastics toy industry and a harbinger of even better years to come.

Expensive Toys

Volume-wise, plastics toys are roughly estimated to account for 40 to 45% of the total toy market. Dollar-wise, how much of the \$900 million worth of toys (retail value) sold in 1953 belongs to plastics is anybody's guess. All that manufacturers will say is that it is big—plenty big! One

Wheels on "fix-it-yourself" stagecoach can be changed with aid of miniature tools



Tough, resilient reinforced plastics body of toy car will withstand hard punishment

Courtesy Owens-Corning Fiberglas Corp.



Toy instruments, realistically molded of styrene, are metallized in the proper color and engraved

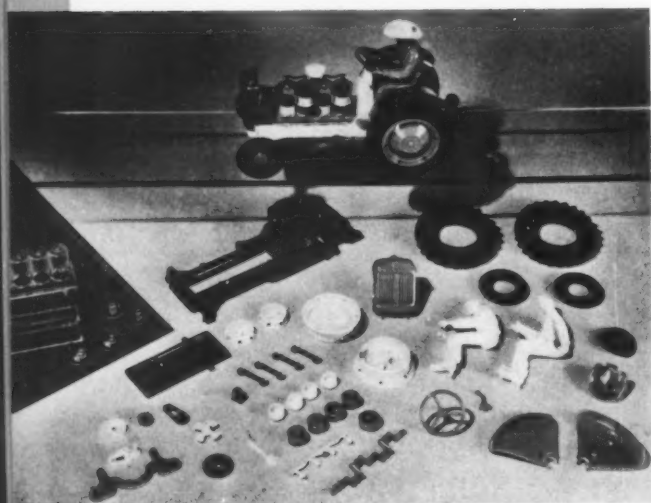
Courtesy Bakelite Co.





Courtesy Halsam Products Co.

Peg-and-socket design of urea bricks enables parts to be joined together when building model homes



Colorful replica of farm tractor, assembled from acetate parts, has visible moving piston action



Courtesy Jolly Blinks Co., Inc.

Soft, washable blocks that produce whistling noise when squeezed are molded of vinyl plastisol

thing sure is that it is expected to take an important leap forward in 1954 and 1955.

This optimism is backed up by the fact that there is a trend in the toy industry to extend the use of plastics materials to the more expensive types of toys. The enthusiastic response over the years to properly designed, solidly constructed toys in the low-cost category—a phase of the toy field in which plastics have traditionally excelled—has encouraged manufacturers to try their hands at bringing the basic advantages of plastics and the economies of mass production to higher priced toys.

Reinforced Plastics Sport Car

One such toy was introduced early this year at the Toy Fair in New York when Inland Mfg. Corp., Buffalo, N. Y., displayed a prototype of a three-wheel toy sports car with a body molded of fibrous glass-reinforced polyester resin.

According to the manufacturer, the use of reinforced plastics for a toy as subject to the child's abuse as this one, is a significant development in wheeled goods construction and may well be the first of a wide array of similar playthings molded of the same material.

The plastics body, mounted on a welded steel tubular and channel frame, has many advantages which give it an edge over the conventional metal toy car. It is exceptionally tough and will not dent, warp, rust, corrode, or deteriorate from exposure to the elements. Although measuring 35 in. long, 25 in. high, and 25 in. wide, the car weighs only 35 lb., permitting the car to be easily maneuvered by the child.

Since color is molded into the fibrous glass-polyester resin laminate, the car does not require any surface painting—except for the front grill and identifying emblems—that might fade, chip, or peel. There are no seams in the one-piece body.

Designed with the sweeping lines of the plastics sports cars put out by the major automobile companies, the toy is available in red or aqua and is suitable for children from three to ten.

Hedstrom Union Co., Fitchburg, Mass., also introduced a similar toy sports car with a reinforced plastics body at the Toy Fair. Called the Sportster, this model measures 46½ in. long, is 19¾ in. wide, and 17 in. high. The semi-pneumatic tires, with which the car is equipped, run on molded nylon bearings.

The 6½-lb. body of the car is molded in one piece in matched steel molds and is then mounted on the metal frame. It is available in three colors—blue, green, and yellow.

Polyester Kite

Polyester material—this time in the form of a lightweight film—also played a part in another unusual toy development. The Flexikite Co., New Haven, Conn., introduced at the beginning of the year the first completely flexible kite without a rigid frame.

Because the diamond-shaped kite, with its curved "wings," is fabricated of (To page 308)

Built to Take a Beating

Life expectancy of a tool depends on its handle.

Only the celluloseics can stand up to constant abuse



CELLULOSICS belong to tools like trunks to elephants. Plastics handles on chisels and screw drivers have become so commonplace that wooden handles have become curiosities.

The Rotuba Extruders, Inc., Brooklyn, N. Y., is a leading extruder of plastics rod for tool handles. Since 1947 the company has been using cellulose acetate butyrate and cellulose acetate almost entirely. Company officials state that most of their rod material for tool handles is extruded butyrate—that its attractiveness and ability to stand up under most adverse conditions made it the most satisfactory material for conforming with government specifications for screw driver handles and mallet tips which can be used in both arctic regions and the tropics. Under arctic cold, it does not become brittle. Under tropic heat, it doesn't expand or soften, isn't likely to "drive through" or break.

Furthermore, both these celluloseics have Underwriters' approval as slow burning. Their resistance to oil and gasoline, and their good electrical insulation qualities, make them ideal for use by electricians and linemen.

Rotuba spokesmen assert that plastics screw handles began to take over from wood at least

15 years ago when extruded cellulose nitrate moved into the field. Nitrate is just about as tough and resilient a material as could be found and has always given satisfactory performance but it presents hazards in production. Since 1947 the company has concentrated on butyrate and acetate as materials that come closest to giving the toughness and brilliant color of nitrate. Even the familiar amber color of nitrate handles has been matched.

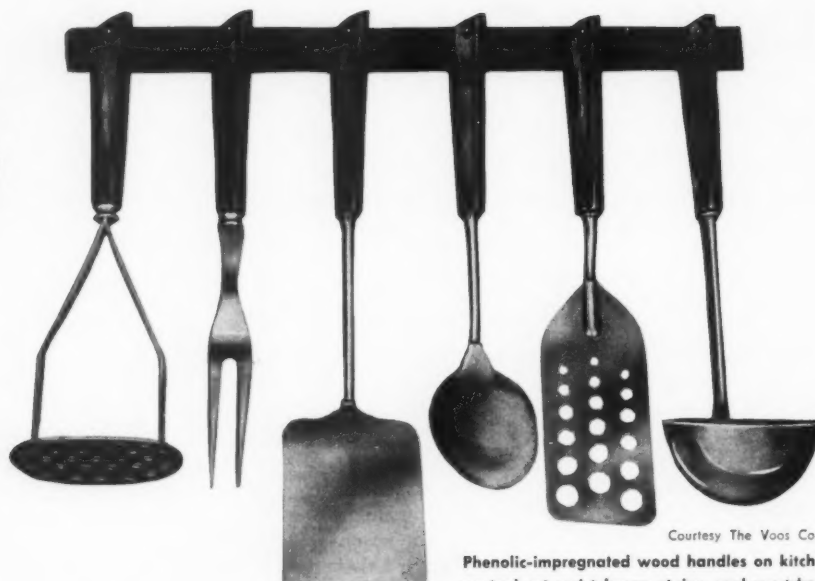
Advantages of plastics over wooden handles are many and varied, according to manufacturers who use them. They will take a (To page 269)



Photos courtesy Eastman Chemical Products, Inc.

Steel blades of chisels are firmly mounted in tough extruded butyrate handles

Hollow butyrate screw driver handle with removable cap houses variety of bits



Courtesy The Voos Co.

Phenolic-impregnated wood handles on kitchen tool set resist burns, stains, and scratches

Phenolic + Wood = Quality

Cutlery handles made of phenolic impregnated wood withstand

high temperatures and detergents used in automatic dishwashers



AUTOMATIC dish washers that subject cutlery to temperatures of around 180° F., lots of steam, and the degrading influence of chemical detergents, have made life rather rough for many of the plastics used as cutlery handles. To overcome these problems, a number of cutlery manufacturers have adopted phenolic impregnated wood as the product best suited to their needs.

The Voos Co., New Haven, Conn., first made shears, razors, butcher knives, surgical instruments, and other steel cutting tools in the United States in 1879. The family history goes back to a sword-making progenitor in Europe in 1487. The present plant was first occupied in 1919. Stainless steel flatware and kitchen cutting tools have been produced there ever since stainless steel was developed. Every type of handle available has been tried since. Before World War II, the company's percentage of plastics handles was about 10; today, about one third of all its flatware handles are plastic, with Pakkawood the prevailing material. Most of the other handles are stag, horn, or steel.

Reasons given by Voos for using Pakkawood are as follows: good balance so (To page 277)

Durability as well as appearance of flatware is enhanced through the use of rugged Pakkawood handles

STOKES*plastics review*

VOL. 2

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Automatic Vacuum Metallizer Finishes Plastic Toys at 1200 per Hour

Ideal Toy Corporation of Hollis, N. Y., said to be the world's largest producer of toy soldiers, tanks and submarines, junior-size kitchen ensembles, tea-sets and other plastic toys, points to four features of the Stokes automatic vacuum metallizer which are helping to make high production records and useful economies.

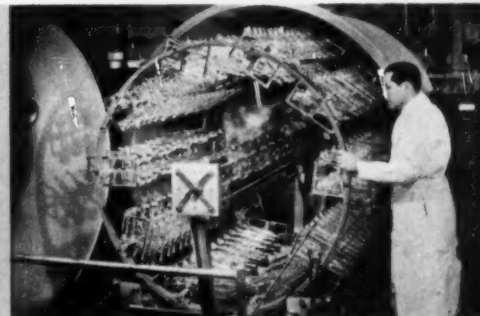
First, the capacity of the big chamber—six feet in diameter and five feet in length—permits the processing of as many as 300 or more pieces per batch in some sizes. Then, pushbutton control of pump-down, heating and vaporization speeds the metallizing cycle so that as many as four cycles per hour can be completed. Volume becomes tremendous on the prevailing 24-hour 7-day weekly schedule.

Further, accurate and regular timing adapts the batch operation of the Stokes metallizer to a semi-continuous program. Racks of pieces are loaded, lacquered, dried and ready for metallizing as fast as each preceding batch is completed.

All of this, of course, contributes to economical operation, but there is a basic economy which depends on the opacity of the metal coating deposited under vacuum. Perfect coating allows Ideal to use scrap plastic left over from other molding operations. This is ground and re-used without regard to color. Vacuum metallizing gives a brilliant mirror-like finish which requires no polishing or buffing and completely conceals the streaked or mottled plastic beneath.

Many of Ideal's toys are sold with a clear lacquer finish over the aluminum coating; others are made to simulate brass by yellow dyeing of the topcoat of lacquer.

Brilliantly finished toy musical instruments leave the Stokes Vacuum Metallizer after coating with aluminum. These can be finished with clear lacquer to give the effect of silver, or the lacquer can be dyed to simulate brass.



STOKES

Plastics Outstrip Autos in Rate of Growth



The growth of the automotive industry, especially in this country, has been one of the wonder spectacles of modern times. In its years of most rapid development it was observed that the industry doubled itself every five years.

It occurred to us that it might be entertaining to see how the Plastics Industry stacks up against the automotive record. For that purpose we dug out some S.P.I. figures on "Synthetic Resin Production." These are continuous by years from 1927 to 1954, the latter estimated.

We were interested to find that for the 28 years listed there were losses—trifling losses—in only five of the years and gains in 23 years over the year preceding. These gains varied over a range from as little as 1% to as much as 70% but averaged 33% per year!

Figuring backwards by five-year intervals from 1954, we found that the volume of resin production each fifth year was 2.65 times as great as for the fifth year before, exceeding by approximately one third the progress of the automotive industry in its growing years.

We have noted before in this column that the Plastics Industry is growing as fast as any in the country. Perhaps it may now be said that this is the most dynamic sustained growth of any big industry in history. Plastics Excelsior!

Mack Molding Cuts Cost with Stokes Automatics

plant. They were quickly tooled up for five electrical appliance parts and are now in continuous production in large quantities.

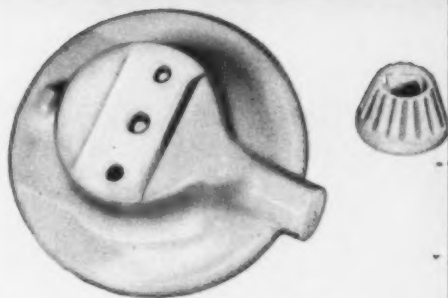
These parts were previously made on semi-automatics. Among them is a knob for RCA-Victor TV sets being made of phenolic in a 12-cavity mold. A larger piece with five pins for the cover of a Frigidaire electric refrigerator is being made in a 2-cavity mold. Complete service from blueprint to inspection is geared to customers' assembly schedules.

The trend of custom molders to consider fully automatic molding, and make use of it—as they are in growing numbers—depends on the opportunity to make savings in labor cost and mold cost. For most economical production, semi-automatic molding often demands big molds, multiple cavities, preforms, heaters, and a man in constant attendance while the press is running. This means high mold cost and still relatively high labor cost.

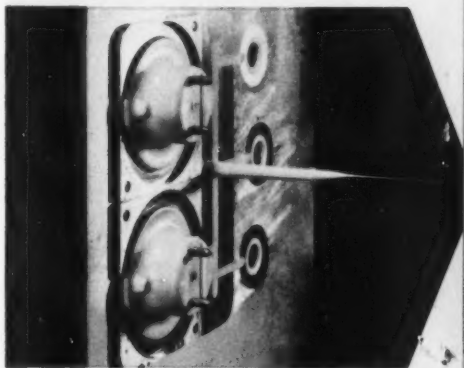
When it is possible to mold the piece on a fully automatic press, labor cost approaches the vanishing point, since only a fraction of a man's time is required to feed powder to the hopper and remove finished parts. The number of cavities, and therefore mold cost, can be kept in line with production requirements.

The fully automatic press gives great flexibility. And it is suited for an amazing number of parts. We welcome the opportunity to analyze parts for their suitability, or adaptability, to fully automatic molding.

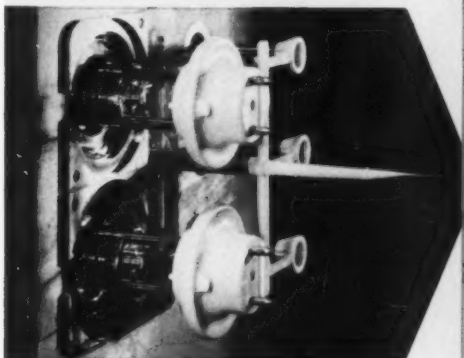
One of the Stokes 15-ton Model 800 fully automatic molding presses at the Wayne, N. J., plant of Mack Molding Company, Inc. The 800 press handles all thermosetting plastics, including alkyds without press modification. Cycles are fast, mold cost low.



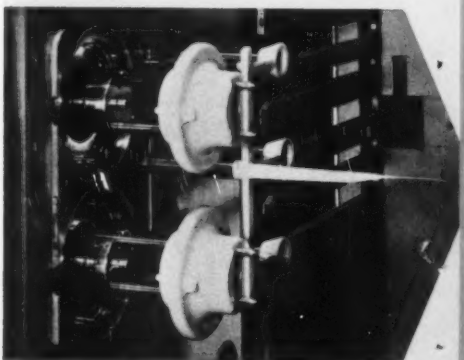
Finished spinning reel cases and knobs made on the Stokes truly Automatic Injection Molding Press. These are turned out completely free of sprues and runners, and ready for packaging. Molding operations shown in adjacent sequence pictures.



1. The press is fully open, showing a 5-cavity mold making two different fishing reel parts.



2. The parts and runner system are positively ejected by hydraulically operated embedded knockout pins. De-gating has been accomplished during the ejection stroke.



3. The parts remain in the fully ejected position as the comb starts across the mold face.

New Automatic Injection Molding Machine Highlights Stokes Plastics Show Exhibit

Imagine an injection molding machine which operates entirely *automatically*! Which gives *positive ejection*! Which produces *finished pieces*! Pieces which *don't need de-gating*!

This long-sought machine doesn't need to be imagined any more. It's here, and Stokes has made it! You can see it in operation at the Plastics Exposition in Cleveland, June 7 to 10. Though it is now to be shown publicly for the first time the Stokes 4-ounce Automatic Injection Molding Machine has been making precision parts for more than three years in the hands of leading manufacturers of electrical and automotive parts.

The NEW Stokes Model 700, a 4-ounce truly automatic injection molding machine.

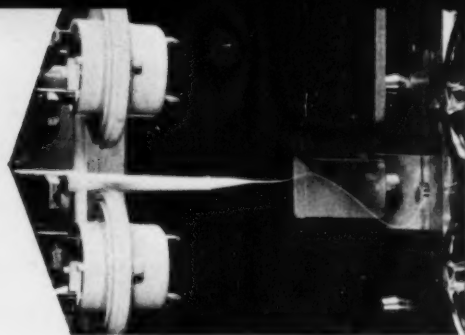


Stokes has a long history of making automatic molding machines which are unique in efficiency and low cost of operation. The successful creative ideas and manufacturing techniques embodied in these machines have been translated to injection molding in the new machine which you can see at the Cleveland show.

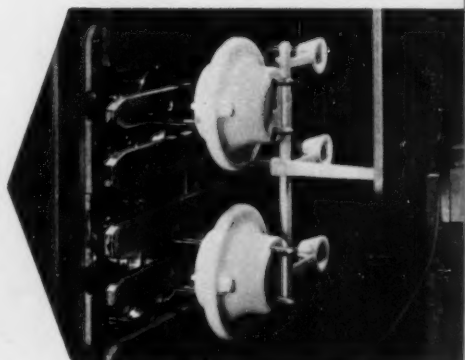
Truly automatic injection molding reduces labor cost as much as 90%! Since only a tenth of the usual labor is required, labor ceases to be a significant factor in manufacturing cost. Therefore the molder is no longer obliged to make compromise decisions between mold cost and labor cost per unit of production.

Machine and mold investment for injection molding can now be determined purely on the basis of production requirements. Fewer cavities can be used; mold cost can be kept to a minimum. An important feature of the new Stokes machine is that it is universally automatic; two- or three-plate molds with ejector pins or stripper plates are handled with equal facility.

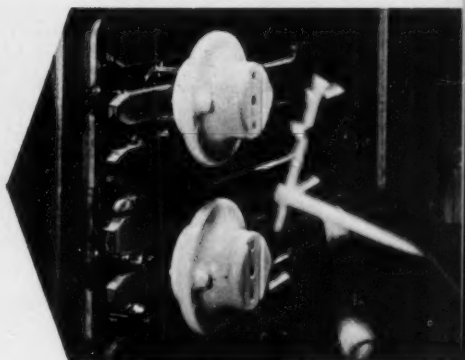
As in all Stokes automatic machines, every step in the molding cycle is automatically controlled to insure parts of identical high quality. The cycle, once established, is permanently maintained. Therefore, temperature of the material is constant, pressure is uniform, and identical perfect parts are continuously produced. All operations are timed to occur in the correct sequence. This prevents any one operation from taking place until the preceding operation has been completed, thus preventing damage to machine or mold. Should any interruption occur the machine will automatically stop until the condition is corrected and the press re-started. No reliance is placed on air ejection; there is no chance that a part may stick to a knockout pin. Continuous production is provided by fully positive ejection and mechanical removal of finished parts from the knockout pins.



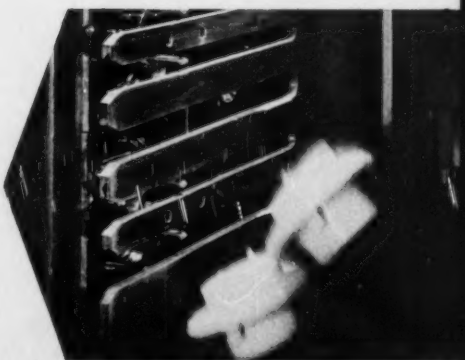
4. The comb has nearly completed its travel. The knife blade has been cammed on to the face of the stationary mold in position to shear the sprue thread.



5. The thread has been cut. The comb is accurately and firmly positioned behind the parts.



6. The pins are retracting. The three small parts, with sprue and runner, are falling into the chute.



7. Further retraction of the pins completes ejection of the two large parts. Prior ejection of smaller parts actuates an electronic device which directs larger parts to separate collecting bin.



Quentin M. White

**White
Named Manager of
All Plastics
Equipment Sales
at Stokes**

Quentin M. White, manager of sales and development of thermo-setting molding equipment for the F. J. Stokes Machine Company, Philadelphia, Pa., has now been made manager of the Plastics Division. He has been given additional responsibility for sales and development of Stokes-Windsor plastics extruders and the Stokes injection molding machine, the latter newly announced and described in this issue.

Mr. White joined the Stokes organization as a plastics molding sales engineer immediately following his graduation from Lehigh University with a B.S. in Mechanical Engineering. He has presented numerous papers before meetings of the Society of Plastics Engineers on new developments in automatic molding techniques.

Stokes Straight Ram Semi-Automatic Proves its Value to Custom Molder

A Model 726 press installed in February, 1953, was followed by another in July at Squires Plastics, Inc., custom molders at Verona, Pa. Terminal blocks and cases for photographic equipment, and appliance handles, indicator knobs, sealing plugs and switches are characteristic of the company's phenolic products.

An adjacent view in the Squires plant shows production of terminal blocks with relatively deep draw and thin sections, as well as inserts. The 726 press is particularly suited to this type of work, yet without sacrifice of flexibility in handling many simple, flat pieces.

The Stokes straight ram presses at the Squires plant are running five days a week, three shifts a day, at 15 to 30 heats per hour with molds of one to 40 cavities.

M. L. Worstell, Plant Superintendent, says, "Stokes presses have improved production for us by 35% over equipment previously used, and with less operator fatigue. Product quality has been improved by the better cut-off and constant pressure. The presses run with a minimum of attention and the controlling timer is easily adjusted for different cycles."

Mr. Worstell refers to the patented Stokes Bar Controller which controls every step of the molding

cycle. This controller requires only finger-tip adjustment for any desired duration of steps in the cycle. Once established for a given job, the controller can be re-set to repeat the same cycle at any time.

Preforms for use on Squires' Stokes presses are made on Stokes Model F preform presses.



Operator removes parts from Stokes Model 726 semi-automatic 50-ton compression molding press. Control panel and power unit are at left.

STOKES

F. J. STOKES MACHINE COMPANY

5534 TABOR ROAD, PHILADELPHIA 20, PA.

STOKES MAKES: High Vacuum Equipment, Vacuum Pumps and Gages/Industrial Tableting, Powder Metal and Plastics Molding Presses/Pharmaceutical Equipment

PRINTED IN U.S.A.

Table Cover Comeback

New methods of fabricating and decorating superior vinyl film

have given plastic table covers new prestige, new high sales

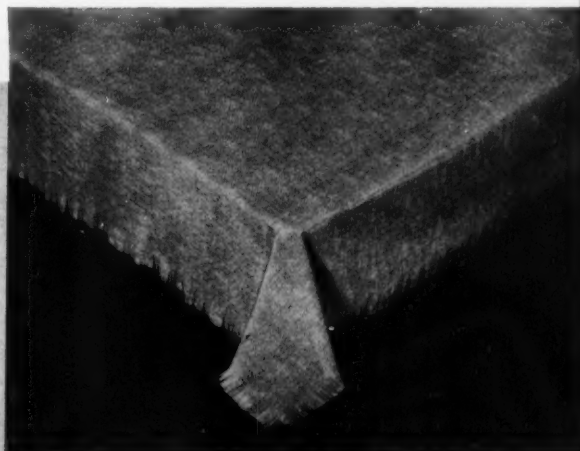


PERHAPS the most outstanding about-face in vinyl film products has been that made in table covers or tablecloths. When these products made their first big impact on the market shortly after World War II, vinyl table covers were 4 mils thick and sold for over a dollar. But they couldn't stand prosperity. In no time at all thickness of the product had been reduced to 2½ mils by many producers and they were being sold on the streets by pitchmen at much less than one dollar each. Vinyl table covers probably descended to the lowest level of any vinyl product both quality-wise and price-wise. And volume production declined.

Within the last year or so, vinyl table covers have made a remarkable comeback. They are far better and far more dignified products. The better tablecloths today are 6 mils or more in thickness. The price has been upgraded to \$1.59 or more. Texturing, design, color, scalloped edges have all combined to give an impression of quality that makes today's vinyl film table cover (To page 378)



Rejuvenation of vinyl tablecloth is sparked by such styling as scalloped edge and embossed satin finish



Courtesy Weiss & Klau, Inc.
Texture effects on vinyl table cover—made possible through embossing techniques—contribute to renewed popularity of product

Vinyl film laminated to flannel backing makes a durable table covering which does not have a tendency to slip on table top



Thanks to the use of plastics, sturdy 1954 model portable radio is light, compact, and designed in the modern manner. For examples of what earlier model portables looked like, see bottom illustrations on opposite page



The Smaller the Better

Today's portable radios embody the principle of complication

at mold design stage to achieve simplicity in assembly

IN 15 years, the miniaturization of electronic components, improved circuit design, more functional application of plastics materials, and advanced mold engineering have been combined to cut the size and weight of Philco portable radios by 80% while, at the same time, improving their efficiency. A chronological account of this use of plastics will trace the course of achievement.

Early in 1939, Philco brought out its first truly portable, battery-operated radio. This set sold for \$29.95. In spite of 15 years of spiraling prices, the efficient use of plastics and technological advances have permitted Philco to market its 1954 model, which is better designed, more compact, and more efficient, at an even lower price than the original portable—\$24.95.

Exterior use of plastics in the first 1939 Philco portable was confined to phenolic knobs and a pyroxylin-coated fabric to cover the wooden

cabinet. The approximate weight of the empty cabinet was five and one-third pounds. Later in 1939, a cellulose acetate pointer and a formed acetate window replaced the metal pointer and glass window that covered the dial face.

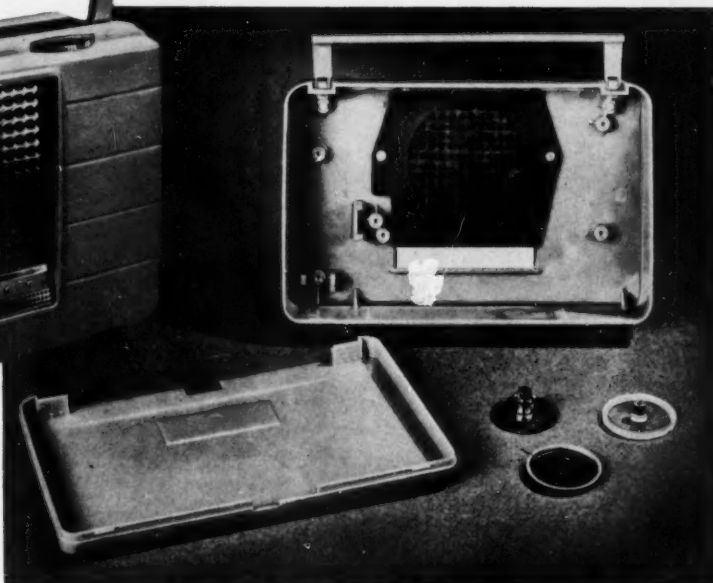
An injection molded cellulose acetate butyrate front section containing the tuning window, knob escutcheon, and grille opening was produced in 1940. Later in 1940, Philco introduced its first injection molded butyrate portable radio cabinet. Thermoplastics Inc., Div. of The Standard Products Co., St. Clair, Mich., did the molding of what was, at that time, one of the largest injection moldings in production. A pyroxylin-coated fabric, used as decorative trim, covered the cabinet, with the exception of the escutcheon. This particular portable earned a MODERN PLASTICS Competition award for 1940.

Production of all consumer portables ceased



1954

Cabinet, handle, and control knobs of 1954 portable are molded of styrene. Molded-in lugs and bosses simplify assembly operations and provide support for the various electronic components



during the war years and the first post-war models in 1946 and 1947 reverted to a wood cabinet as a result of plastics materials allocations.

Post-War Models

Seeking a material that would be virtually unbreakable, Philco produced a low-pressure formed cabinet made from sheets of United States Rubber Co.'s Versalite in 1948. A die cast aluminum frame was used to join the formed front and back sections.

An all-styrene portable cabinet was first produced in 1949. In this model, bosses, lugs, and mounting ledges, most of which had to be individually fitted into former models, were molded-in. This proved to be a tremendous time-saver in the final assembly of the chassis into the cabinet.

In 1950, in addition to using a styrene cabinet, Philco adopted a molded styrene carrying handle, held to the cabinet by metal clips. Recesses permitted the handle to fold flush with the top sur-

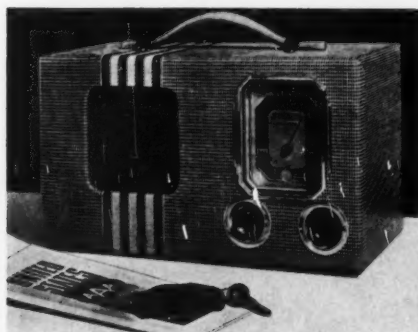
face of the cabinet. A separate transparent styrene escutcheon was given a rear or second surface lacquer treatment. This form of decoration produced an appearance of depth and also served to prevent marring of the exposed surface of the escutcheon. The interior of the cabinet had molded-in bosses and reinforcing elements to hold not only the chassis but also the battery and the speaker components.

In the years 1951 and 1952, improved methods of molding metal inserts into the cabinet were developed to take full advantage of technological advances in chassis design. The structure of the radio itself became smaller, permitting the use of smaller, more compact cabinets.

Decorative Elements

The use of metal and styrene as decorative elements began in 1953. Perforated sheet plastic stock over the speaker assembly was used to further lighten the cabinet, to (To page 328)

1939



Photos courtesy Philco Corp.

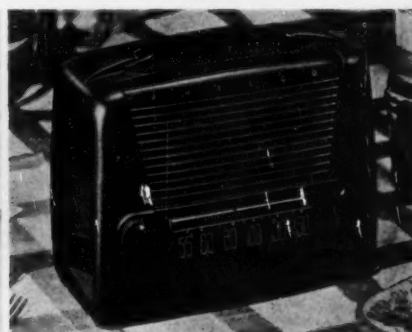
Clumsy 1939 model had wooden cabinet covered with pyroxylin-coated fabric . . .

1940



. . . by 1940, cabinet—though still of wood—had butyrate front panel . . .

1949



. . . in 1949, streamlined cabinet was completely injection molded of styrene



Vinyl liner for Doughboy swimming pool is removed from the cardboard carton in which it is compactly packed with the metal fence



Photos courtesy Bakelite Co.

Packaged Pools

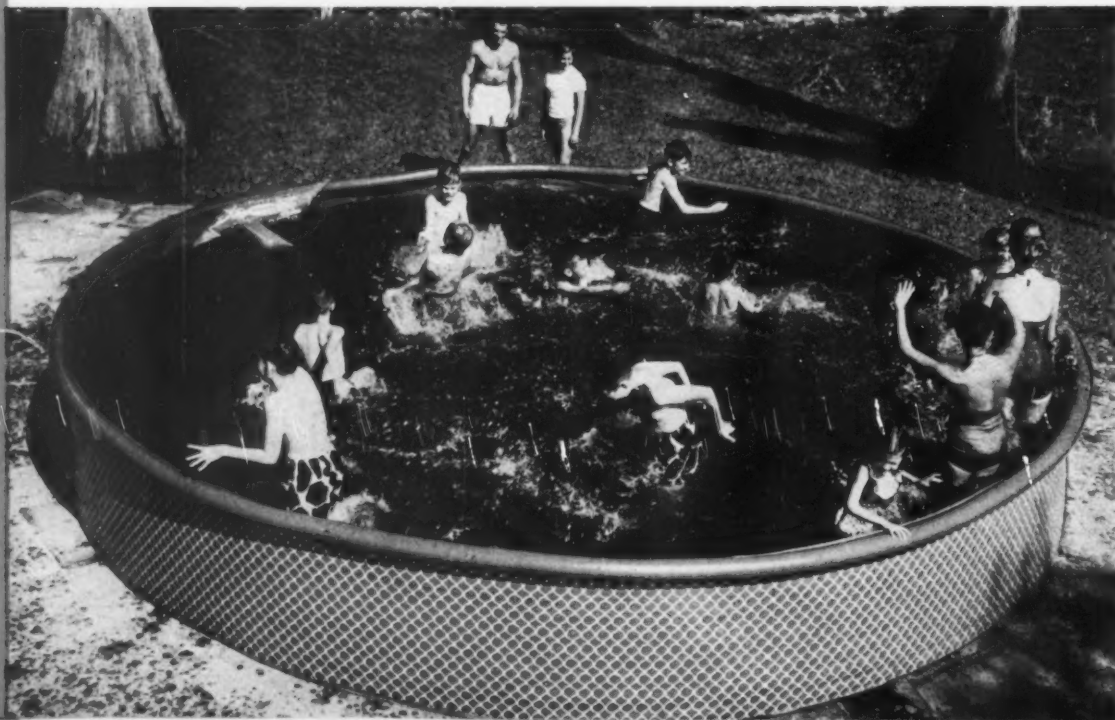
Junior's wading pool has grown into a family affair as large as 20 ft. in diameter

THE original inflatable one-child wading pool of a few years ago has developed into a king-size swimming pool that can accommodate a dozen or more children or adults. Made technically and economically feasible by larger and more adaptable heat-sealing equipment and by even better vinyl film formulations, these family-size pools are a direct development of the popular "blow-up" type of wading pools and are being marketed by the same companies making the inflatables.

This summer, two such companies will be marketing similar types of family pools. Bilnor Corp., Brooklyn, N.Y., offers a family pool decorated with an appropriate nautical design. These pools, all 3 ft. high, are available in 8½-, 12-, 16-, and 20-ft. diameters. Doughboy Industries, Inc., New Richmond, Wis., markets a similar series of family-type wading pools also 3 ft. high and in 8½-, 12-, and 18-ft. diameters.

Both pools can be quickly set up (To page 355)

Family-size Bilnor pool set up, with heavy-gage vinyl liner supported around the circumference by wire fence



New Day in Distribution

Seven reasons why more and more products are being shipped, displayed, sold, and used in plastics bottles, vials, and tubes



Courtesy Lusteroid Container Co., Inc.
Shatterproof, lightweight acetate tubes and vials, fitted with screw caps, dispensing nozzles, or other end closures, have proved ideal for packaging many pharmaceutical preparations in pill or powder form

COSMETICS, nuts and bolts, fishing lures, pharmaceuticals, bubble-bath liquid, cheese spreads, battery acid, liquid saccharin, shampoo . . .

The above heterogeneous array of products may appear to have nothing in common. Actually, however, they do. All of them are being successfully packaged—along with scores of other items—in plastics bottles, vials, and related containers. In fact, in recent years, plastics have revolutionized the packaging of vast numbers of consumer as well as industrial products.

What lies behind this important packaging development? Some of the basic factors include:

- 1) Plastics containers are light. Some of them weigh as little as one-tenth as much as comparable glass containers. This makes them easier to handle and results in important savings in shipping costs.
- 2) Thanks to the durability of plastics containers, breakage in transit and handling is virtually eliminated, doing away with costly delays, returns, etc.
- 3) Containers may be had in a variety of stock and custom sizes and designs, and either clear and transparent or in an almost unlimited range of colors.
- 4) Tasteless, odorless, and non-toxic, plastics

containers possess excellent resistance to alkalis, alcohols, and weak acids. This makes them suitable for a wide range of food products, cosmetics, and other items.

5) Plastics containers lend themselves well to high speed filling, closing, and identification by means of labels or direct imprinting.

6) Frequently the plastics containers incorporate built-in dispensing valves or other features not customarily found in most other types of containers. Polyethylene squeeze bottles are a classic example of functional packaging.

7) Many plastics containers serve a re-use function after removal of the original contents. Some squeeze bottles are designed so that the dispensing valve may be removed and the container refilled for continued service.

With such an imposing list of advantages, it is hardly surprising that more and more manufacturers are finding in plastics tubes, vials, and bottles the answers to their packaging problems.

In addition, the high-capacity injection molding machines now found in many plants, can produce containers in greater quantity at lower cost. In the case of polyethylene bottles a great deal has



Plastics jars and vials have wide range of applications: styrene vials with polyethylene caps (left foreground) are used to ship bull semen; polyethylene and styrene jars are for general household storage



Courtesy Water Wizard, Inc.

Tap water in polyethylene bottle is "distilled" by passing through ion exchange resins in polyethylene cartridge screwed to top of bottle

Ingenious shoe polish applicator consists of a clear, lightweight, tubular, molded butyrate container with butyrate cap and base. Turning the base forces the polish out through the center of a thick felt stopper, which spreads it evenly over shoe surfaces without smearing hands of user

Courtesy Eastman Chemical Products, Inc.



Stock molded polyethylene squeeze bottle with molded phenolic nozzle and styrene cap is effectively used for home and garage dry-chemical fire extinguisher

Courtesy Plastics Unlimited

Small precision metal parts in oil bath are sealed in dip-formed, transparent vinyl tube
Courtesy Goodrich Chemical Co.



Stock polyethylene bottle with transparent plastic feed tube eases task of replacing fluid in hydraulic brake systems
Courtesy Crystal Research Labs., Inc.



Wood screws have increased sales appeal when they are packaged in transparent acetate containers with colorful slip-off caps and bases
Courtesy Eastman Chemical Products, Inc.



been learned about bottle design, optimum wall thickness, dispensing valve assemblies, and closures. From the original Boston round style bottles, polyethylene containers have burgeoned into an array of stock and custom designs meeting the special requirements of hundreds of products. At the same time, several thermal and electrical techniques have been devised for treating polyethylene so that printing on polyethylene containers, one of the most stubborn handicaps encountered in the early days of their development, is no longer a serious problem.

Size and Use Range

Plastics containers today range in size from tiny one-shot syringes for pharmaceutical products to 13-gal. blown polyethylene bottles used in shipping hydrofluoric acid and other hard-to-handle chemicals. Space does not permit a full review of present container applications, but the following paragraphs suggest the scope of what is being accomplished through the use of plastics in this field.

A manufacturer of wood screws, anxious to accelerate the merchandising appeal of his products at the retail level, supplanted the previous paperboard boxes with transparent tubular containers of cellulose acetate having bright red bases and slip-off caps of the same material. With this type container, there is no room for doubt in the consumer's mind; he can observe the size, quantity and quality of the contents without opening the package, which also serves as a handy home container for the screws. All label data are imprinted directly on the tubes as required, eliminating the need for maintaining large inventories of pre-labeled containers.

In modified form, fitted with a suitable type of dispensing nozzle, the same type container makes an excellent "puffer" for powdered products, ranging from powdered graphite for lubricating inaccessible lock mechanisms to the new styptic powder, Styp-It, which can be sprayed on the

fingertip and applied directly to shaving cuts and other minor cuts to stop bleeding.

Flexible cellulose acetate tubes have found wide usage for such products as foot powders, in which controlled dispensing is an important package feature. Dental floss is also sold frequently in this type container, equipped with a screw cap having a built-in cutter. Pharmaceutical capsules, printing ink, needles, and small precision metal parts are among the many other types of products which may be advantageously packaged in this form of plastic container.

Rigid molded tubes, vials, and bottles made of cellulose acetate, styrene, and other types of plastics open up additional packaging opportunities, with the number of products involved limited only by the ingenuity of the manufacturer. A wide selection of closures is also offered—snap-on lids of polyethylene, threaded metal or molded plastic covers, or lids having internal lugs which mate with projections on the containers themselves.

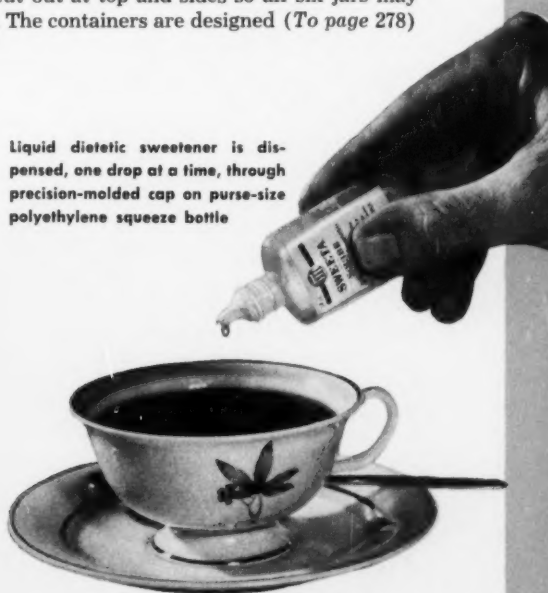
Insemikit Co., Inc., Baraboo, Wis., offers three stock sizes of rigid styrene vials—2-, 5- and 8-cc. capacity—to artificial insemination associations for the shipment of bull semen. The tubes come complete with leakproof friction caps of molded polyethylene. The low cost of the plastic vials makes one-time use practical, and eliminates the need for an inventory system on vials returned by technicians. Non-toxic to bull semen, they save the time usually required for re-sterilization of glass vials. These same plastic vials are also adaptable to the packaging of tablets, capsules, powders, liquids, and many other types of products, ranging from fish bait to watch parts and ball bearings.

One major supplier of rigid styrene and cellulose acetate vials has launched a new line of transparent styrene containers called "Empteers," which are supplied with white or black metal screw caps. These attractive containers, available in 2- and 4-oz. sizes, come packed in a convenient folding carton cut out at top and sides so all six jars may be seen. The containers are designed (To page 278)

Apothecary jar, molded of pure white modified polystyrene, is designed to hold six sample tubes of skin lotions and ointments and a blow-molded polyethylene bottle containing anti-pruritic lotion. Jar was used in sampling program to physicians



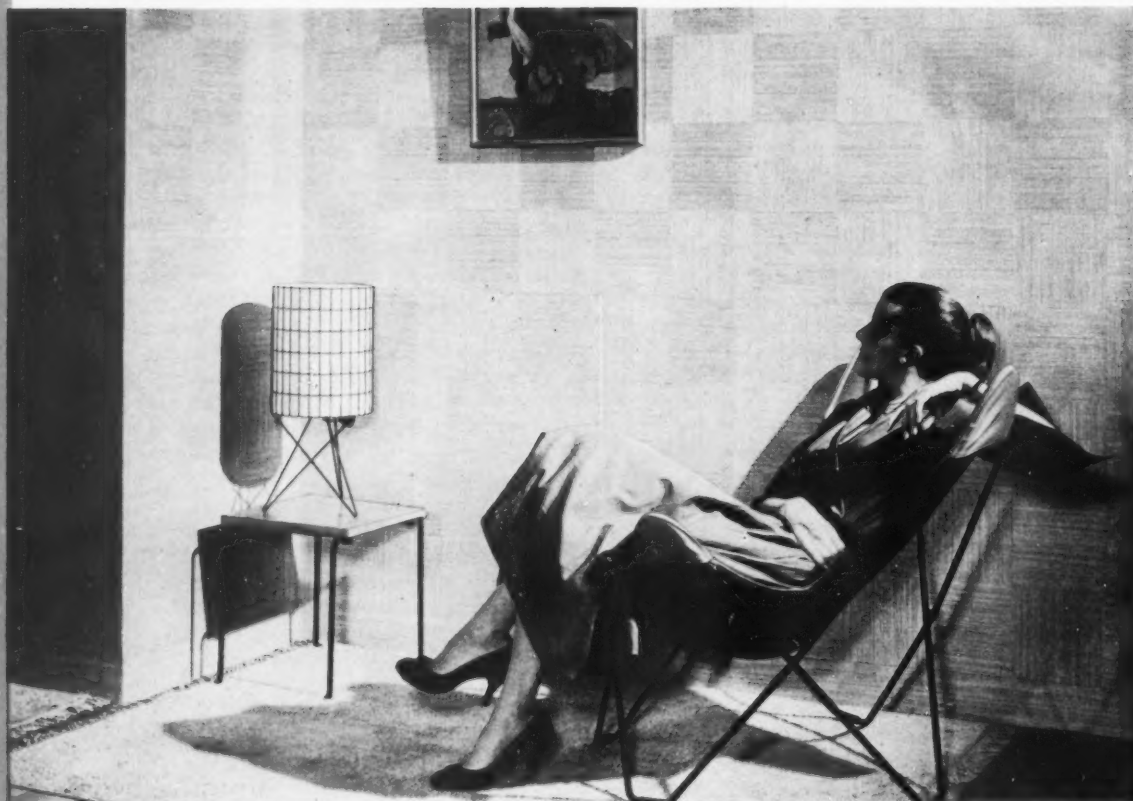
Liquid dietetic sweetener is dispensed, one drop at a time, through precision-molded cap on purse-size polyethylene squeeze bottle





Goodbye Redecoration

Vinyl wall coverings are beginning to do for all the rooms in the home what styrene wall tile has done for kitchens and bathrooms



Photos courtesy Bolta Corp.

Accenting modern room decor, vinyl wall tile resembles wood parquetry but, unlike textured wood, requires no finishing. Once installed, it eliminates need for periodic repainting or recovering of walls

IN kitchens and bathrooms, where a hard, non-absorbent, easily cleaned wall surface is essential, molded styrene tile has proved to be an ideal material. This leaves a good many other rooms in the average dwelling (in addition to a vast array of offices and reception rooms, transportation ticket offices, restaurants, theater foyers, etc.) which can make profitable use of a modern wall covering material combining color, texture, scuff resistance, permanence, and ease of cleaning. With increasing frequency, vinyl tile or vinyl-based material is being specified for these uses.

A wall covered with vinyl tile combines beauty, utility, and long life. The possible range of colors,

patterns, and textures is virtually unlimited for any desired decorative effect. The product is flexible, light in weight, and relatively easy to install since it may be cut with scissors wherever fitting is necessary. Although more costly than some less permanent types of wall coverings, vinyl tile is quite economical as a long-term investment because it eliminates expensive periodic scraping, painting, or wallpapering. Most types of soil may be removed easily with a damp cloth, and the material resists common household stains. With vinyl tile on the wall, the housewife can bid goodbye to most of her redecorating problems.

In the period since World War II, vinyl tile and

other forms of vinyl wall coverings have enjoyed a steady growth, though not so spectacular as that recorded by styrene tile. This is understandable in view of the fact that, while molded styrene tile is an alternate form of a wall material with which the building field has long been familiar, vinyl tile has no close counterpart in previously used wall covering products. Fitting in particularly well with modern interiors and the swing to more casual, uncluttered living, vinyl tile gives the imaginative architect, interior decorator, or homemaker an exciting new working tool. As the public grows increasingly familiar with this product, and appreciates that it will deliver the same rugged service as vinyl upholstery materials, automotive trim, and other growing applications, such as luggage coverings, vinyl wall tile may be expected to move into steadily increasing volume.

Product Development

Bolta Products Sales, Inc. (now Bolta Corp.), Lawrence, Mass., long identified as the producer of Boltaflex vinyl upholstery material, has done an outstanding product development and merchandising job with Bolta Wall-Tile, which was introduced to the market in 1952. Both Bolta Wall-Tile and a companion product, Bolta-Wall, consist of a decorative surface of embossed vinyl film, approximately 0.015 in. thick, laminated to specially processed rubber-saturated paper backing about twice that thickness. The resulting product is flexible, easy to handle, and cements permanently to plaster, plasterboard, compressed hardboard, and plywood. Bolta-Wall, supplied in roll form 48 in. wide, is recommended only for professional application, while Bolta Wall-Tile may readily be installed by the Saturday afternoon mechanic.

Bolta Wall-Tile measures 8 in. square and comes packed in cartons containing 54 tiles. This amount will cover 24 sq. ft. of wall area. At present, it is offered in two patterns—bamboo and the new mahogany pattern. In the bamboo pattern, the buyer has a choice of four colors—natural, tea rose, gray, and green. Bolta-Wall is available in a choice of bamboo, mahogany, and leather grain textures. Both products are attached to wall surfaces with Bolta-Wall adhesive, a special cement which adheres readily to the paper backing.

After preparation of the wall surface, where necessary, the adhesive is applied to the walls with a notched spatula and spread with a notched trowel. Previously, the proper starting point is determined by spacing off tile squares for a balanced installation.

Easily Cut to Odd Shapes

As the tiles are applied by pressing them firmly into place against the cement, joints are rolled from time to time with a seam roller until the "pulling action" of the adhesive draws them securely against the wall—an interval of 30 to 45 minutes. When tiles must be trimmed for accurate fit, they may be held in position and punctured

at top and bottom with the pointed end of a pair of scissors. Then they are marked on the back with a pencil line and cut to exact size by means of scissors or a photo-print trimmer. Ease of cutting makes it possible to obtain a neat fit around electrical outlets and other surface interruptions.

To facilitate installation of the tile, Bolta has developed continuous corner stripping in 2- and 4-in. widths, which may also be used as a border or trim. Corner stripping is creased tightly and cemented to inside or outside corners before field tiles are put in place, insuring a neat installation at the corners. After all tiles are mounted, a small brush, such as a toothbrush, is dipped in clear water and used to remove excess adhesive from seams. Any open seams are then concealed with Bolta-Wall colored filler No. 605, and excess filler is removed with a clean dry cloth.

Bolta Wall-Tile gives the finished appearance of wood parquetry but, unlike textured wood, requires no further finishing. Specially formulated to resist shrinkage at the seams, the vinyl surface will not crack, flake, chip, or grow brittle with age. Spattered foods and spilled drinks, smudgy fingerprints and ordinary dirt and soil whisk off with a damp, soapy cloth or sponge. The plastic face sheet is up to six times as thick as the coatings found on most waterproof wallpapers, providing maximum protection against scratching, scuffing, and snagging. The tiles retail at approximately 17¢ each, or around 38¢ per square foot, and the kit containing all necessary tools retails at \$2.00. Other accessories are also available at nominal cost.

While the development of special adhesives, colored fillers, and corner stripping typify the progressive steps taken by Bolta with this product, they do not tell the entire story. (To page 307)

Tiles can be cut with scissors and are easily applied. Pattern below is three-dimensional bamboo



Success Story:



Florence design was inspired by oriental lacquer ware



Boontonware Belle expanded an established line

SEVERAL publications serving the retailing field have reported in recent months that department store buyers of housewares and china are reflecting as much enthusiasm for selling molded melamine-formaldehyde dinnerware as are the materials suppliers and the molders themselves. This, in itself, constitutes an achievement of sorts for the molded plastic dinnerware industry, because in its early days—only a relatively few years ago—it faced a problem in selling its ware. The public was wary in its attitude toward any new plastic product.

Another problem was that the retail price of melamine dinnerware placed it in the category of good china and pottery. It was necessary for the molder to sell the store buyer on the advantages of molded dinnerware, so that the buyer could convince the sales person who, in turn, had the job of selling the customer in the store, overcoming any prejudice against plastics in general, against price in particular, at the same time pointing up the many distinct advantages of melamine.

Despite these hurdles, and they loomed large at the time, the molders and the stores persevered in their missionary sales work. Their foresight and

intelligent merchandising were gradually rewarded. Retail sales in 1953 probably approached \$25,000,000, though exact figures are not available.

In terms of pounds of molding material, the figure is estimated at about 15 million as compared with 10 to 12 million for 1952. Again, exact figures are unavailable, partly because of the reticence of the two major molding material suppliers—American Cyanamid and Barrett Div., Allied Chemical and Dye—to make their estimates public, and partly because of the difficulty in breaking down the total amount sold into that used for dinnerware and that used for other applications. This is because several important dinnerware molders also mold other products of melamine.

Despite this lack of exact sales figures, it is apparent that the business is sizable and still growing. Molders continue to increase their production facilities by adding more presses or, as in the case of The Branchell Co., by building new plants. Only last summer, this company opened a new plant in Puerto Rico to boost the production of its *Color-Flyte* for retail and house-to-house sales, the latter being a field in which Branchell pioneered and is still very active.

Melamine Dinnerware

Last year's sales were far above 1952. Twenty-two molders share a 25 million dollar

business based on adherence to tough standards and severe quality control

In addition to expansion by existing dinnerware molders who already numbered 20—15 of them producing lines for retail and commercial markets alike, the other 5 molding for commercial purposes such as use by the Armed Forces, institutions, and restaurants—the total increased by two within recent months. Northern Industrial Chemical Co., already established as a molder, brought out a line named *Residential*, designed by Russel Wright for the consumer market. Kenro Co., a new plastics molder, is introducing a consumer line named *Holiday*. These entries into the field brings the total number of dinnerware molders to 22. Of the 20 previously in the business, one branched out from the commercial into the retail field. This was Applied Plastics Div., Keystone Brass Works, which introduced *Suburban*, designed by Wilbur Adams, about a year ago. It is continuing to sell its *Restraware* to commercial as well as institutional markets.

Since the establishment of Commercial Standard 173-50 early in 1951, prepared by the Commodity Standards Div. of the Department of Commerce

as a standard for alpha-cellulose-filled melamine dinnerware, the quality has become fairly uniform. Most molders have at least one style which meets this standard, although lighter weights are produced for use by airlines, to whom light weight is especially important, and for other types of light-duty use. The specification covers physical properties, methods of testing, and design standards, the latter being especially helpful to institutions as a guide in their purchasing. As a group, molders have found it helpful in establishing the quality of their products not only in the product itself, but in the minds of their customers as well.

Quality and Tradition

The manufacture of dinnerware has always adhered to tradition and, in many instances, craftsmanship, both of which contribute to quality. Previously molded in only solid opaque colors without decoration, melamine might have seemed limited in its ability to compete in a traditional market. This disadvantage hasn't turned out to be as great as might have been (To page 344)

Both shape and texture are distinctive in *Residential* line of molded melamine dinnerware
Photographs courtesy American Cyanamid Co.





Best Seat in the House

The secret of sales success in the plastics toilet seat field lies in design for strength. A variety of materials and methods are used

IN THIS ever-changing world, the basic shape of the toilet seat is one of the few things that has, of necessity, remained unchanged.

But that is about the only phase of the toilet seat industry that has not advanced progressively in the 15 years since plastics first made their debut in the field. Improved techniques in the production of plastics toilet seats have resulted in a more economical product; better plastics materials have led inevitably to more durable, more attractive, and more functional seats, and this combination of low cost and high quality has served to bring about an increasingly growing consumer acceptance of the product.

Colorful and Durable

Before the introduction of plastics, the majority of toilet seats were made either entirely of wood or of a rubber shell molded and vulcanized over

a wooden core. The wooden seat, while it was more economical, was uncomfortable, could be easily scratched or chipped, and would often open up at the joints where it had been glued together. The molded rubber seat, despite its many advantages over the wooden seat, could be produced only in black.

With the advent of the plastics age, the toilet seat industry found an ideal solution to many of its problems. With seats molded in one piece, there are no joints to open up. The smooth surface of a plastics seat, with its glossy, lustrous finish, is not only attractive and lasting but facilitates cleaning. And plastics toilet seats are available in colors ranging from the overwhelmingly popular white to light pastels that match any bathroom color scheme.

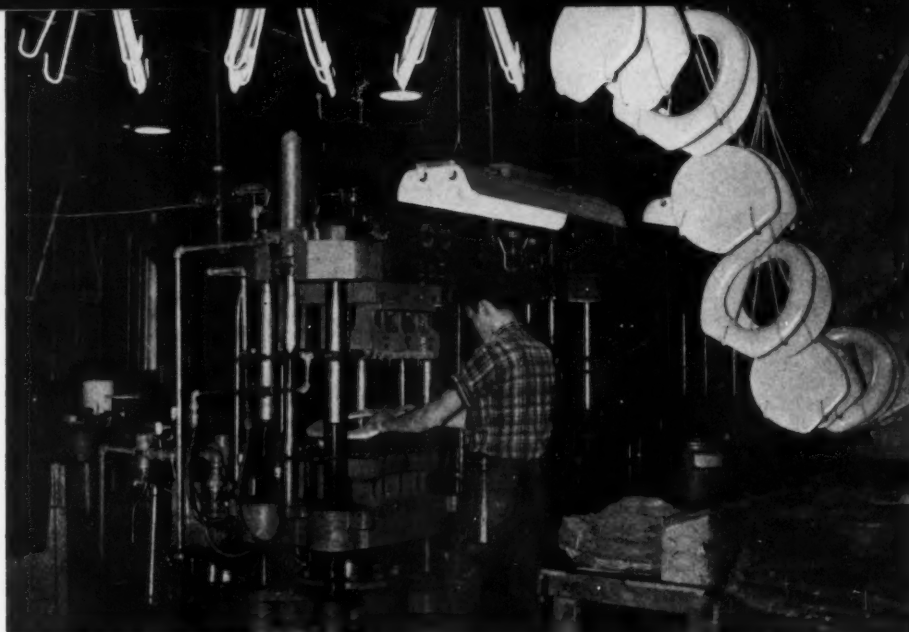
From the standpoint of durability, today's quality toilet seats boast an exceptionally long service



Acetate skin is compression molded over a hardwood core to give toilet seat and cover added attractiveness, comfort, and rugged durability

Modern Plastics

Operator removes acetate-covered wood seat from compression press. Overhead conveyor carries molded seats to assembly point where covers are attached to molded-in inserts



Courtesy C. F. Church Mfg. Co.

life. The emphasis behind this statement is on the word "quality." Immediately following World War II, a number of inadequately designed plastics shell seats were introduced to the market. These seats were thin in wall sections and lacked molded-in ribs or supports.

Today, thanks to consistent adherence to high standards by the vast majority of the leading operators in the field, most of the poorly designed, sub-quality products have disappeared. Today's plastics toilet seats, making the most of improved materials and more efficient techniques, have won the confidence of the consumer as a tough and attractive addition to the home.

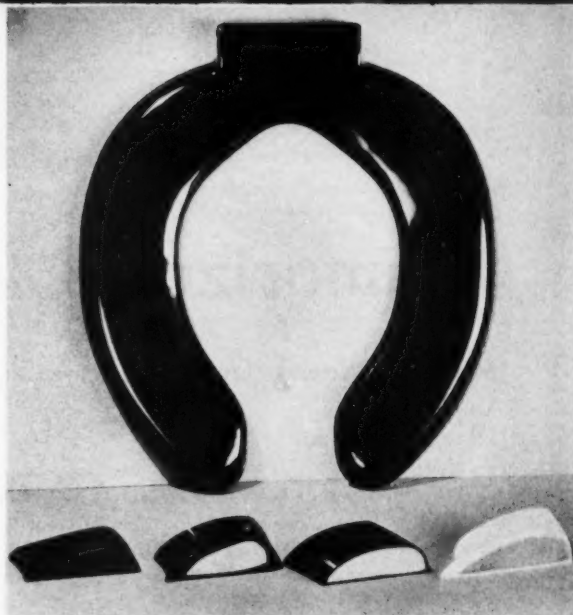
Production Economies

In addition to durability and appearance, perhaps the most important advantages derived from the general switch to plastics are the many economies effected in mass-production. Since metal hinges and inserts can be molded into the seat and cover, the assembly of the finished product is also greatly simplified, contributing significant savings to the manufacture of the seat.

In the modern plants of C. F. Church Mfg. Co., Holyoke, Mass., for example, finished toilet seats—including wooden cores covered with cellulose nitrate sheet, alkyd resin coated wooden seats, wooden cores covered with molded acetate faces, and molded solid phenolic seats—roll off the assembly line by the hundreds every day.

Sheet-Covered Seats

Historically, the first plastics seats to be made by Church had wooden cores covered with a sheet of cellulose nitrate, a version which originated in the early 1900's. Although these sheet-covered seats were higher-priced than conventional seats—even today they remain the most expensive products in Church's line—they offered a degree of comfort, durability, and luxurious appearance



Cross-sections of solid phenolic, acetate covered hardwood, and two acetate-covered wastewood seats

which had never before been available in either wood or rubber.

Over the years since its introduction, the sheet-covered seat has retained its high quality stature, designed for use in the more expensive homes. The nitrate sheet, which is sealed to the hardwood base to provide the smooth finish, is available in handsome pearl or plain finish and in white, black, or color to harmonize with towels, curtains, bathmats, or other accessories in the bathroom. Since two separately fabricated sheets are used to cover the top and bottom of the seat, visible joints or seams are eliminated by lapping the edge of the sheet which is (To page 356)



With the help of a variety of vinyl accessories, yesterday's cluttered clothes closet is miraculously transformed into an orderly and neat storage room



Glamorized Clothes Closets

Modern vinyl closet accessories are far superior to those made only a few years ago

VINYL film has revolutionized the closet accessory business. Its utility for this purpose has been so well developed by fabricators that what amounts to a new industry has grown around it. Of course there were closet accessories long before vinyl film, but vinyl has been the motivating factor in a vastly increased business and in making closets a far more useful and orderly asset for the housewife. There once was a time when a man or woman dreaded to open a closet door for fear of being knocked over by an avalanche of stuff that fell off the shelves or, worse yet, of the closet contents having been ruined by moth larvae.

Vinyl garment bags and shoe bags have led the parade in this march toward glamorous and more orderly closets. Old style fabric garment bags once sold for around \$12. Today's vinyl bags generally sell for less than \$4 and are reported to be far better than the old timers. Greatest improvement insofar as appearance is concerned is probably the adoption of quilted vinyl for the front panels that are exposed to view when closet doors are open. If the customer doesn't care for the quilted appearance she may choose a basket weave, or other embossed texture, which also gives a substantial looking appearance to the finished product.

Quilting is done on a complicated stitching machine that sews together an outer layer of 4-mil vinyl, a cellulose filler, and an inner layer of polyethylene. In high quality quilting, rather thick layers of material are used to give an appearance akin to that of hand-set tile. Strong nylon thread with color to match the vinyl film is used for the quilting operation.

Reinforced and Double Stitched

In the line of closet accessories produced by Henry A. Enrich and Co., New York, N. Y., the garment bags are built on a steel frame—four corner posts and the necessary cross bars to give them strength. The Enrich bags are sewed at each corner—some bags on the market are simply wrapped around without sewing. There is also a double stitched binding on every seam to prevent pull-outs. Further reinforcement of all Enrich bags is accomplished by using pieces of buckram between the vinyl film and the filler at all stress points such as around grommets. Further reinforcement is provided by quilted tabs sewed to the bag where it rests on the hanger rod. Small felt washers used with grommets prevent dust from entering the bag.

The polyethylene lining is used to prevent the cellulose filter from raveling and becoming dirty. It is also impervious to the chemical action of moth balls, although moth prevention is generally taken care of by encasing a quantity of moth repellent in an acetate tube that is hung in the bag.

Metal zippers are much more securely fastened to the garment bag of today than of yesterday. Cording is securely fastened along the edge of the zipper tape to prevent ripping. A polystyrene pull of sufficient size to give a secure grip is used instead of the conventional tiny metal tab.

Enrich also makes fabric chintz garment bags that sell for a higher price but company officials state that the vinyl bag is far more popular. Styles similar to the chintz are also available on vinyl and the difference in texture can only be ascertained upon close examination. In addition, the vinyl surface is much easier to keep clean than a fabric surface.

Vinyl shoe bags are almost as popular as garment bags and improvements over the last two or three years have been even greater because the early ones had a tendency to tear out. Now they are made to hold 8 pair of shoes with little danger of coming apart. Reinforcing with buckram, double stitched seams, 20-gage film for the backing and 8-gage film for the pockets help to strengthen the construction. Embossing in a simulated taffeta texture and a polyethylene film lining on the inside of each pocket dress up appearance. Special reinforcement is provided for the hanging apertures and a wooden dowel inserted along the top of the bag insures that it will lie flat across the wall or door. Such shoe bags sell today for \$2.98 to \$3.98 each.

The average housewife generally starts her acquisition of closet accessories with a garment or shoe bag. Purchase of just one nearly always leads to more—a visitor to a small town family in upper New York State reported 12 garment bags in that one home. And the trend is rapidly spreading to many other accessories which make the family closet more useful and orderly. Other accessories in the Enrich line include: Small chests of drawers with wooden frames and chipboard panels covered with quilted vinyl have 4 or 5 drawers and hold an unbelievable amount of material formerly piled on shelves or tucked in bags. Even gliders are supplied on drawer bottoms so they will slide freely.

Boxes or chests, similarly constructed, have acetate windows so the contents can be seen. Some of them are made with drop fronts so they can be piled on each other and the housewife can get into them without taking off a top cover. They are especially handy for storage of such things as blankets. At one time the problem of warpage caused by the use of a wet adhesive was serious but that was licked by eliminating the staples that were used as an auxiliary to hold the acetate in place and finding an adhesive which permitted contraction and expansion without damaging the acetate or chipboard.

Hat boxes are both square and round. The square ones have a vinyl covering (To page 284)



Availability of different quilted vinyl accessories in same pattern appeals to modern, decor-conscious homemaker...

... while bags and boxes of the same material in dark colors find growing popularity with the man of the house
Photos courtesy Henry A. Enrich and Co.





Records Swing to Styrene

Development of special formulation and equipment has built an industry which now consumes 8 million pounds of material annually

FROM zero, eight years ago, to 8 million lb. of material per year in 1954 is the success story of polystyrene in phonograph records. First styrene records, of mediocre quality, were 78-r.p.m. disks produced from standard material; injection molded records now encompass all speeds and all grooves and are made of a special styrene formulation which gives excellent tonal quality and frequency response as well as long playing life. And the styrene records of today are practically unbreakable.

Two factors largely responsible for the success of this project were 1) the engineering of machinery and the techniques for molding and 2) the development of a special styrene record formulation. Credit for the first goes to Al Massler and James Wilson, Bestway Products, Rahway, N. J., who were the first to successfully injection mold phonograph records; to Bakelite Co. goes credit for developing the special material.

It is significant that the styrene record formulation was perfected by the largest manufacturer of vinyl for compression molded records, which

spent thousands of dollars to develop this styrene formulation, knowing full well that the styrene would go into direct competition with its vinyl. When asked which material produced the better record, C. W. Blount, Bakelite's vice president in charge of sales, responded: "If you had two sons, which one would you love more?" He also stated that, to the unpracticed ear, no difference in quality could be detected and further cited the case of a "blind-fold" test in which even a critic with a practiced ear failed to prove his contention that vinyl records were musically superior to those made of styrene.

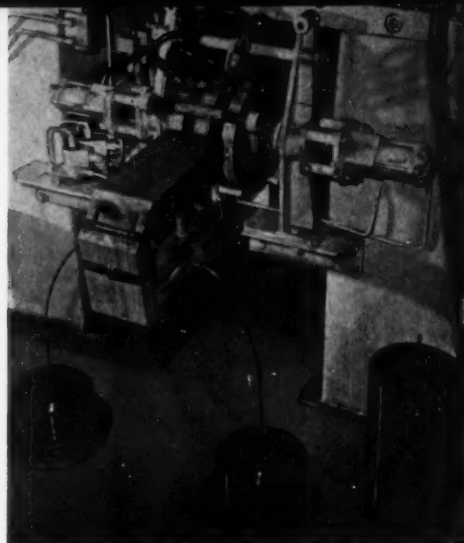
First Injection Molding

Bestway started injection molding records in 1946, and was followed in 1948 by Shelly Products Ltd., Huntington, L. I. In 1950, Columbia Records, Bridgeport, Conn., which had been buying from Bestway and Shelly, decided to start its own molding operation. Today, these three companies are the only ones making styrene records on a production basis.

Bestway, using its own molding machine, known as the M & W, is consuming 200,000 lb. of record formulation styrene per month. Columbia, also using M & W machines, injects 175,000 lb. per month. Shelly, molding on Impco machines, uses 125,000 lb. per month.

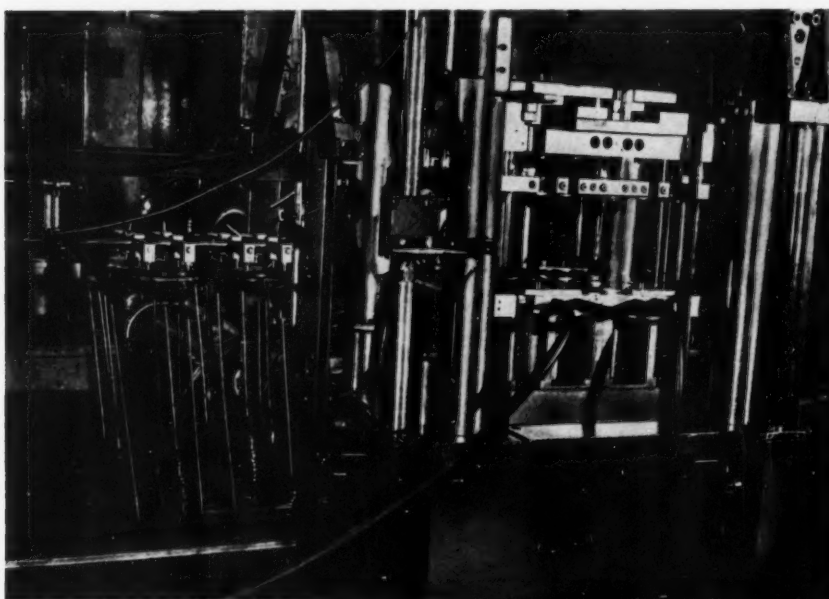
The advantages of the injection process include faster production (as many as 16 records per minute can be made by Shelly), greatly increased life of stampers (up to 50,000 records for 45's and 12,000 for L. P.'s as against a maximum of 1500 when used in compression), less costly material (although the per pound price of styrene is slightly higher than vinyl, its lower specific gravity makes it less costly), and lower labor costs because many machines are now running fully automatically. Others, now running on a semi-automatic basis, are expected shortly to be converted to fully automatic production.

Despite all of these advantages, there is still no



Courtesy Bestway Products

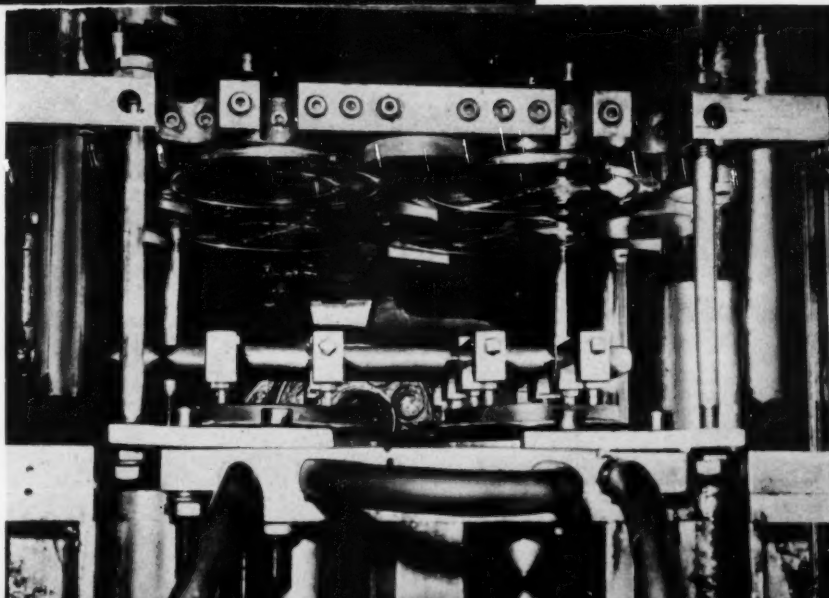
Close-up view of the cooling and collating stations on an automatic injection molding machine being used in producing styrene phonograph records



Four-cavity, vertical set-up for the automatic injection molding of styrene phonograph records operates on a cycle of 30 seconds. Molded records are stacked in collating bins in left foreground

Right: close-up view of top stampers in four-cavity set-up shown in photo above. After the mold has opened, vacuum cups (lower center) pick up the records from the lower stampers, retract from between the platens, and then deposit the finished records in collating bins

Photos courtesy Shelly Products Ltd.



unanimity of opinion among the large producers of records. RCA, for example, is almost definitely committed to stay with compression for the time being at least.

Complete Conversion

Columbia, on the other hand, has definitely decided to convert completely to injection. James H. Hunter, vice president and general manager of Cryton Precision Products, Div. of Columbia Records, states that all of Columbia's production will swing over to injection within the next two years. Bestway is developing equipment and techniques for printing the labels directly on the styrene records, with this operation as an integral part of the automatic molding operation. Shelly is looking forward to completely automatic operation making use of the hot runner molding system which will increase the shot capacity of its machines.

In a recent series of articles by Bob T. Rolontz in *The Billboard*, Golden and Bell Record executives

were quoted as follows: "Our costs would be up to 50% higher if our disks had to be made by compression rather than by injection."

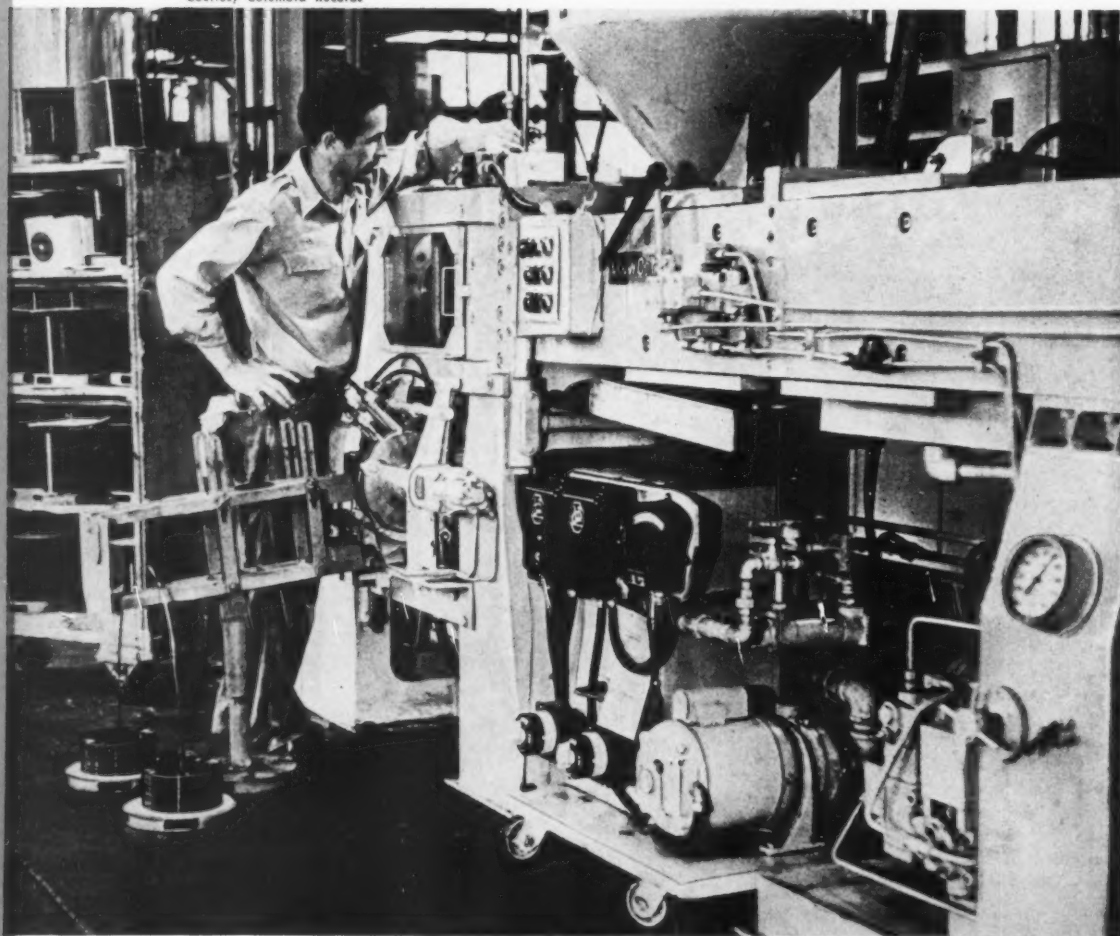
Only time can tell who is correct. The competition between the two systems means that every engineer and plant manager is doing his best to make records more economically and that the consumer will benefit in the long run. Great progress is being made in production techniques and the possibility of lower record prices is very real. To date, this progress has enabled the record companies to hold prices fairly steady in the face of sharply rising labor and material costs.

As an indication of potentials for all phonograph records, a recent industry report states that, since 1950, the total sales of recordings have increased from 144 million to over 190 million units annually.

CREDITS: Material supplied by Bakelite Co., The Dow Chemical Co., and Monsanto Chemical Co. Injection machines by Improved Machinery Inc., Nashua, N. H., Reed Prentice Corp., Worcester, Mass., and Watson-Stillman Co., Roselle, N. J.

The M & W injection molding machine, used to mold phonograph records, operates fully automatically, including the making of spindle holes. A separate ram within the clamp ram actuates pins which produce the center holes in the records and then push the hot material from these holes back through the mold runner to the nozzle of the machine

Courtesy Columbia Records





Heat-resistant, mineral-filled phenolic handles on kitchen utensils stay cool to the touch, are designed so that the housewife's hand is not likely to touch any metal part

Biggest Improvement in Pans

Heavier phenolic handles, of one-piece construction,

bring new beauty and safety to cookware

TODAY'S woman pays special attention to cookware handles. To meet her demands, handles must be beautiful, safe, useful, and sanitary, according to designers and engineers of Ekco Products Co., Chicago, Ill.

These four standards can be met only by the use of plastics, they say. To illustrate, they point to the handles of Ekco's new triple-layer vanadium stainless steel cookware, called Flint-Ware, backed by the largest advertising and promotion campaign ever put behind any Ekco line. Flint-Ware handles are molded from high-heat-resistant, mineral-filled phenolic resin.

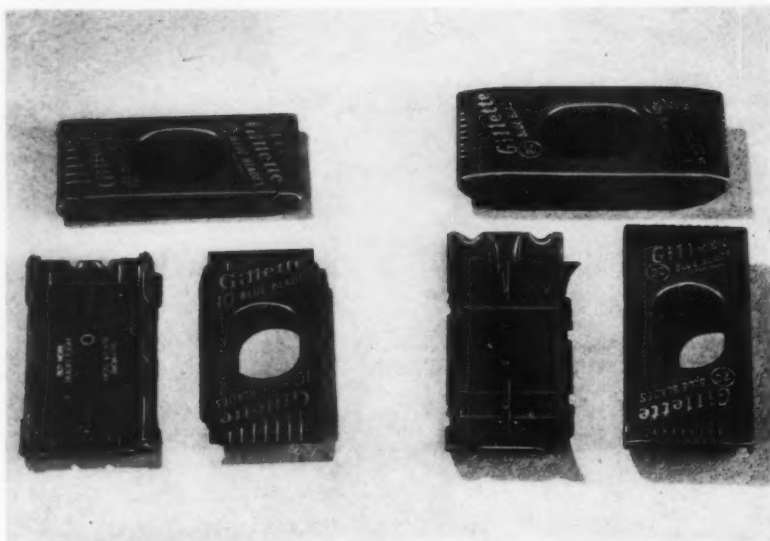
The phenolic pot and pan handle business got going in large volume in the middle 1930's at the expense of wood, which was more susceptible to burning, and of metal, which gets too hot.

Gradually handles became larger and more satisfactory as experience was gained. Ekco says that its original phenolic saucepan handle weighed 2 oz.—now it weighs 4 ounces. Saucepot handles (2 per pot)—formerly 1 oz. each—are (To page 274)

Durable phenolic handles can be molded in a variety of shapes and sizes to fit particular cookware requirements, increasing the beauty of the utensils and making them safer

Photos courtesy Ekco Products Co.





Courtesy Gillette Safety Razor Co.

Ten-pack Gillette razor blade dispenser (left) has top part of molded styrene and bottom part made of metal. Twenty-pack dispenser (right) uses molded styrene parts for both top and bottom

How to Sell More Blades

Put them up in styrene dispenser-packages, increasing convenience and safety

WHEN a package and a dispenser for a product are combined into one unit, sales always increase. Probably the best example of this accepted fact is razor blades. When Gillette first ran a series of test sales in key cities with such a combination, sales increased 33% the first week the new package was offered and 49% the second week. (See MODERN PLASTICS 25, 103 (Dec. 1947).)

Plastics played a large part in the success of this combination package-dispenser, which is made in two sizes to hold 10 or 20 blades. Although there have been some changes in design since it was first introduced in 1947, the same material and same basic design are still being successfully used today by blade manufacturers.

Gillette was first on the market with a plastic package-dispenser for razor blades, but it was not many months before American Safety Razor Co.'s Gem blades appeared in a unique plastic package which served not only as a dispenser, but also as a protective container for used blades. When the last new Gem blade has been used, the dispenser, now full of used blades, is discarded as a unit, thus eliminating the time-consuming and often dangerous chore of disposing of unprotected blades one at a time.

Today American Safety is molding in its own plant 12 different styrene plastic components which are used in the manufacture of nine differ-

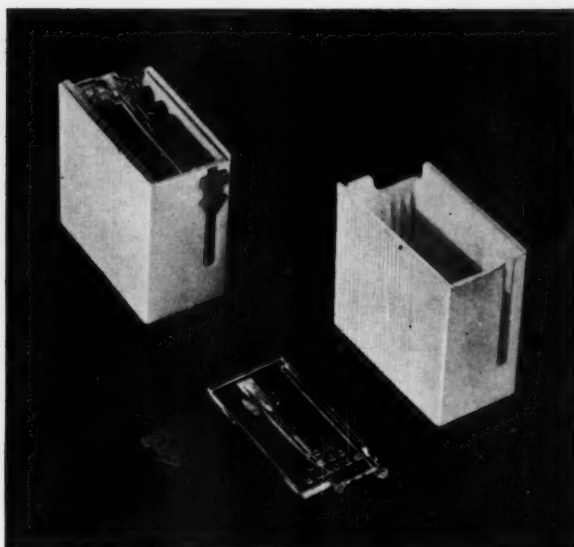
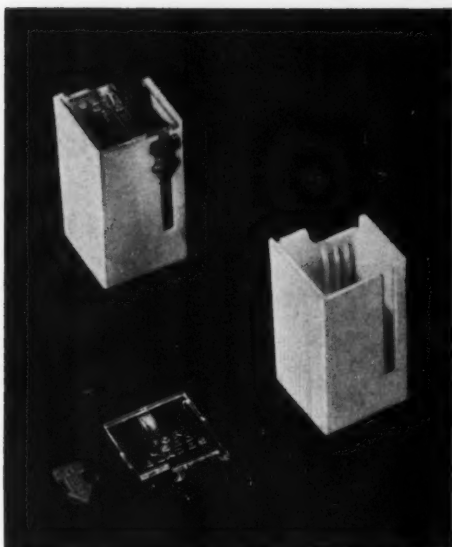
ent blade dispensers. Each package has a used blade compartment. Some of the blades so packaged are Pal, Gem, Star, Personna, Treet, and Silver Star. This group encompasses single edge, double edge, and injector type blades. The company estimates that it uses approximately 250,000 lb. of plastic material per year for these dispensers.

The two original Gillette dispensers have been redesigned since their introduction to provide the convenience of used blade holders. They still are made in the same striking blue color which characterizes the Gillette line in order to retain their product identification value.

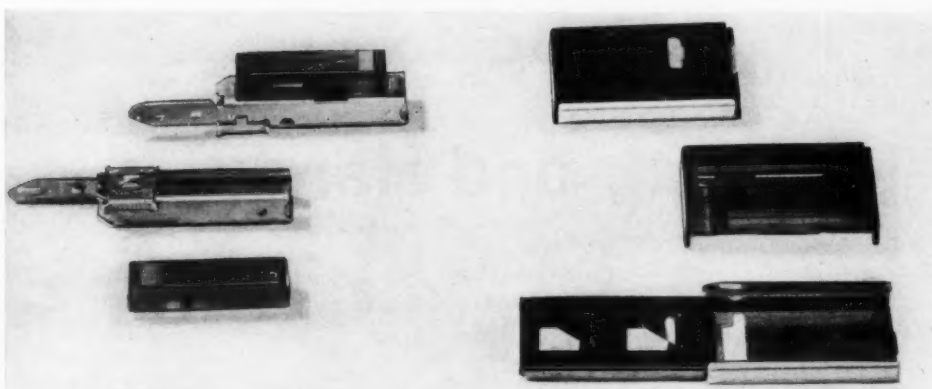
Last year, the sales of double edge razor blades by all manufacturers was in the neighborhood of 800,000,000. Since Gillette claims to enjoy 85% of this business, it is estimated that from 40 to 50 million Gillette dispensers of both sizes were molded. For this number of dispensers, some 800,000 to 900,000 lb. of styrene molding material would be needed.

American Safety states that the use of plastic dispensers has been a major factor in increasing their blade sales from 20 to 25% in the last five years. Gillette has the same story but does not give figures.

CREDIT: Gillette blade dispensers molded by Foster Grant Co., Inc., Leominster, Mass., from Fostarene styrene.

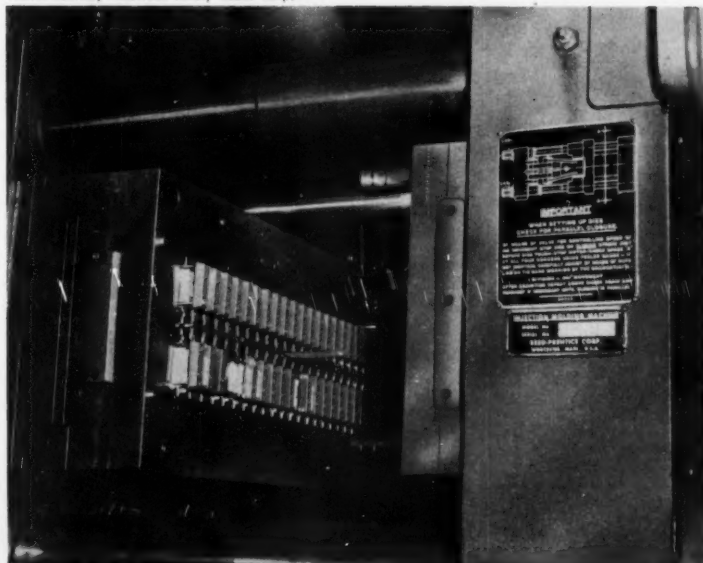


Three molded styrene parts go into the making of the 10-pack Gem blade dispenser (left). For the 20-blade container the same size blade ejector but proportionately larger housing and top parts are used



Used blade holder of injector-type blade dispenser (left) is molded of styrene. Double-edge blade dispenser (right) is made with molded styrene top and sheet metal bottom

Photos courtesy American Safety Razor Corp.



High production rates of used blade holders for injector type blade dispensers is made possible by molding the units in a 40-cavity mold on an 8-oz. injection molding machine



Vinyl appliance covers with strong, tear-resistant sewn seams are typical of the trend toward emphasis on quality in vinyl film covers for home use



Fresh, Clean, and Handy

Proof that a quality line of vinyl appliance covers, food

bags, and bowl covers can beat the bogey of price competition

HOW their mothers and grandmothers ever got along without today's household conveniences, especially in the kitchen, is a mystery to today's younger generation. But they don't worry much about it—they just snip a bit of the house money from month to month and invest it in all sorts of items that make housekeeping easier and neater. Furthermore, mother is rapidly following her daughter's lead in the acquisition of protective coverings for household items. She, too, dips into the household "kitty" in the interest of cleanliness and convenience.

Plastics get a good share of those monthly "snips" and vinyls are an important item in satisfying the urge for cleanliness and neatness. In addition, they help to dress up the kitchen, clothes closets, and bathrooms with color and neat, orderly arrangement with almost as revolutionary a result as when the grocer changed from barrels and bins to individual packages and transparent films.

Seal Sac, Inc., New York, N. Y., is a pioneer

in the business of providing the housewife with bags and sacks designed for use in the home. That company produces a line of vinyl covers for everything from bowls to garments and washing machines. Oil-silk was originally used for these bags and covers, but the advent of vinyl enabled the company to expand its activities far beyond any conception of the business available when the organization was founded in 1935.

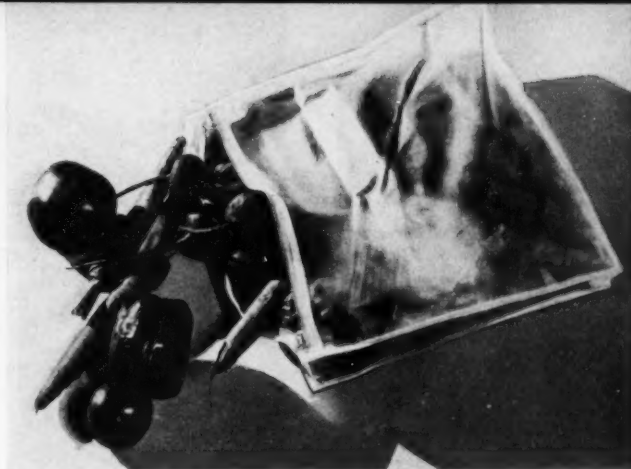
Only Thick Film

Seal Sac scorns the use of any vinyl film less than 4 mils thick. The toaster cover pictured here is an example. It is made of 7½- to 8-gage frosted white vinyl, with sewn seams and sewn elastic braid around the bottom. An 8-mil cast film cover, also carried in stock, is beautifully clear and transparent but the housewife seems to prefer the frosty, translucent cover. Seal Sac will deliver either cover to retail at 75 cents.

Bowl covers are made of 8-gage material. They are still the same price as in 1946—\$1.25 for a

A real space saver, vinyl refrigerator vegetable bag, with handy zipper and reinforced, sewn seams, occupies no more room than contents it holds

Rugged, durable vinyl bowl covers with elastic braid not only provide adequate protection, but are strong enough to support weight of stacked bowls



Photos courtesy Seal Sac, Inc.

set of 7 pieces to fit all sizes from mixing bowls to milk bottles. A three piece set is for large sizes. While there has been no increase in price, customers today get a far better product at the same cost as in 1946.

Vinyl plate covers are a new Seal Sac product. Four sizes to cover the smallest desert size to the largest service plates permit the housewife to protect her finest china from dirt and dust while it is stored between infrequent uses.

Then there is a whole host of food and appliance bags and covers. A bread bag will keep its contents fresh for days; refrigerated vegetable and meat bags come in a range of sizes, one big enough for a turkey; there is even a celery bag. In addition to the toaster cover already mentioned, there are covers for electric mixers, coffee makers, and many more. All of these protective coverings are waterproof and unharmed by grease. The food bags prevent odors from being picked up, are handy for picnic or school lunches, and eliminate all waste space when used in the refrigerator because they take up no more room (to page 305)



Tailored vinyl cover for automatic toaster keeps dust and dirt out of the appliance. While toaster is in use, cover can be folded for easy storage

Infrequently used fine china is fully protected from dust by vinyl covers, can be removed from storage at a moment's notice, used without washing



1954

Courtesy Shaw Insulator Co.

Streamlined beauty, structural strength, and thermal insulation are combined in today's all-phenolic molded electric iron handles—a far cry from the 1928 version (below)

Bigger Handles – Better Irons

Molded phenolics, in larger sections, make today's

electric iron handles cooler, stronger, and more durable

AMONG the lore of the plastics industry is the story of the first phenolic iron handle. It seems that a young phenolic molding compound salesman (now vice-president of a large materials manufacturer) carried around in his briefcase for months a model of an electric iron handle before he was finally able to persuade someone to go ahead and put it into commercial production.

Puny 1928 forerunner of today's magnificent handle was a phenolic cross bar grip between metal uprights
Courtesy Bakelite Co.

1928



True or not, the story emphasizes the fact that hard-to-sell applications based on sound uses of plastics soon become standard big-volume business; today it is almost impossible to find an electric iron—either steam or dry—with anything but a phenolic handle.

The first electric iron handles made in the late 1920's were merely cross bars or hand pieces between two metal uprights. They weighed only 3 or 4 ounces. Today, nearly all electric or steam iron handles weigh from 7 to 12 ounces. Wooden or metal parts have almost disappeared from the upper or "handle" structure of most irons except for the small travel type, which uses a few ounces of phenolic in the hand grip only.

Enclosed Handles

Soon after the simple cross-bar grip came the closed handle with grip, end supports, and base plate all molded of phenolic. The base plate was devised to help prevent the user from touching the hot iron and burning her hand. This type handle was first molded in wood-filled phenolic but was not completely satisfactory because the heat caused carbonization of the wood filler. Asbestos-filled phenolic was then tried but it became too hot after long exposure to the heat of the iron. That difficulty was overcome by (To page 266)

Modern Plastics

It Had to be Sold!

No other plastic product ever faced the marketing difficulties met
and overcome by styrene wall tile. Quality standards
and sound merchandising built a big business



WHEN styrene wall tile was first introduced, it stirred scarcely a ripple in the giant home building and decorating field—a market long dominated by traditional materials such as clay tile. Skepticism was common and for some time even the most enthusiastic proponents of styrene tile could not be certain just where the product was headed. Tile quality varied from producer to producer and suitable adhesives were a problem. Many accessories which produce an attractive finished installation, (inside and outside corner pieces, cove bases, etc.) were not available in plastic.

Today, only about six years later, the issue is no longer in doubt. The progress made by styrene tile constitutes one of the plastics industry's greatest success stories. It is estimated, for example, that between 40 and 45 million lb. of styrene was used for this purpose in 1953, representing approximately 80 million sq. ft. of tile. These figures are expected to be eclipsed during 1954, with new home building proceeding at a brisk pace and millions of existing homes slated for modernization.

Obviously, styrene wall tile could not have risen to its present acceptance in the tradition-bound

Imaginative merchandising and selling techniques had an important part in creating customer acceptance of styrene wall tile. Full-color room scene booklets, such as displayed by salesman at right, enabled the prospective customer to better visualize the decorative potential of styrene tile





Point-of-sale counter displays, emphasizing the availability of plastic cove bases, feature trim, bull nose caps, and related accessories, were part of an aggressive merchandising campaign aimed at making the prospective buyer realize both the beauty and the versatility of styrene wall tile installations

building industry if it did not offer some genuine advantages over competitive products. The inherent features of the tile, such as light weight, economy, integral permanent color, ease of installation, moisture resistance, ability to withstand thermal shock without cracking or checking, and resistance to common household acids and alkalis, are constantly winning new converts as contractors, architects, and home owners become more familiar with its properties.

These plus values, present in some degree in styrene tile from its first market introduction, have been steadily enhanced through improvement in the plastic material itself, better design and molding, broader color selection, and quality standards, along with improved adhesives and more complete matching accessories.

Commercial Standard

Industry-wide cooperation, in the form of a commercial standard covering styrene wall tile, adhesives, and application methods, developed with the cooperation of S.P.I.'s Polystyrene Wall Tile Div., has played an important part in building increased markets for the product. At present, S.P.I. is preparing a promotional manual which will be used by manufacturers to promote demand for standard tile (made under Commercial Standard 168-50, effective July 15, 1950) on the part of dealers and jobbers.

In the final analysis, the growing acceptance of molded styrene wall tile has stemmed largely from the efforts of individual manufacturers. Through their adherence to quality standards, their merchandising efforts, and their close co-operation with floor covering dealers and other retailers,

they have laid the groundwork for this important new outlet for plastic materials.

Among such firms is S & W Moulding Co., Columbus, Ohio, which was not only a pioneer producer of styrene wall tile but has probably done more than any other company to improve its product and work out effective sales and merchandising methods.

Described as "the original Styron wall tile," the S & W product is sold under the Miraplas trademark. Largest of the plastic tile manufacturers, S & W produces Miraplas in a range of 27 colors. In addition to the standard size 4½-in. square tile, Miraplas was recently introduced in a new 8½-in. square King Size tile in conformity with the trend to larger blocks in home decorating.

The new larger tiles are described as the "hottest" item in the Miraplas line at the present time; they have the special virtue of making small rooms look larger. S & W is the first of the tile manufacturers to offer marbled colors and a different design in tile of this size, which is also in great demand for hospitals, hotels, restaurants, bars, and other commercial buildings.

Quality Maintained

In this new and intensely competitive field, S & W has never resorted to price cutting tactics at the sacrifice of quality. In order to meet the competition of lower cost tile, the company developed a companion line which is sold under the Windsor trademark. Recently redesigned, this line is now available in nine colors. As in the case of the Miraplas line, the Windsor tile is available with harmonizing half tiles, feature strips, bull nose caps, etc. Among new sales aids developed

for the Windsor line is a counter easel with actual pieces of tile which provides the customer a selection in color and styling.

S & W was a leader in the introduction of cove base, feature trim, bull nose caps, and related accessories which make possible a complete plastic tile installation from "top to bottom." In the early days of plastic tile, it was necessary to use cove bases made of wood. The company also takes pride in the absolute opacity of its tile and its close attention to color matching. S & W works only with virgin styrene materials and does its own coloring in the plant. Another important contribution was the perfection of Master Mastic, an improved wall tile adhesive which retains its pure white color permanently, is easy to apply, and gives a costly look to the finished installation. A new type of grouting gun recently introduced is said to save as much as 3 hr. in grouting and clean-up time as well as two thirds on mastic.

S & W's aggressive sales and merchandising policy, directed by Hal Mirvas, sales manager, includes advertising in leading "shelter" and trade magazines. Most of the Miraplas advertising budget is earmarked for sales promotion. For the Miraplas sales clinics, which have been attended by as high as 300 retail representatives, a field staff covers the nation, putting on down-to-earth "how to" demonstrations on sales strategy, installation pointers, etc. Cartoon flip charts and other sales stimulants are used extensively in connection with these meetings and recently a special 20-minute color sound movie—the first (To page 271)



Photos courtesy S & W Moulding Co.

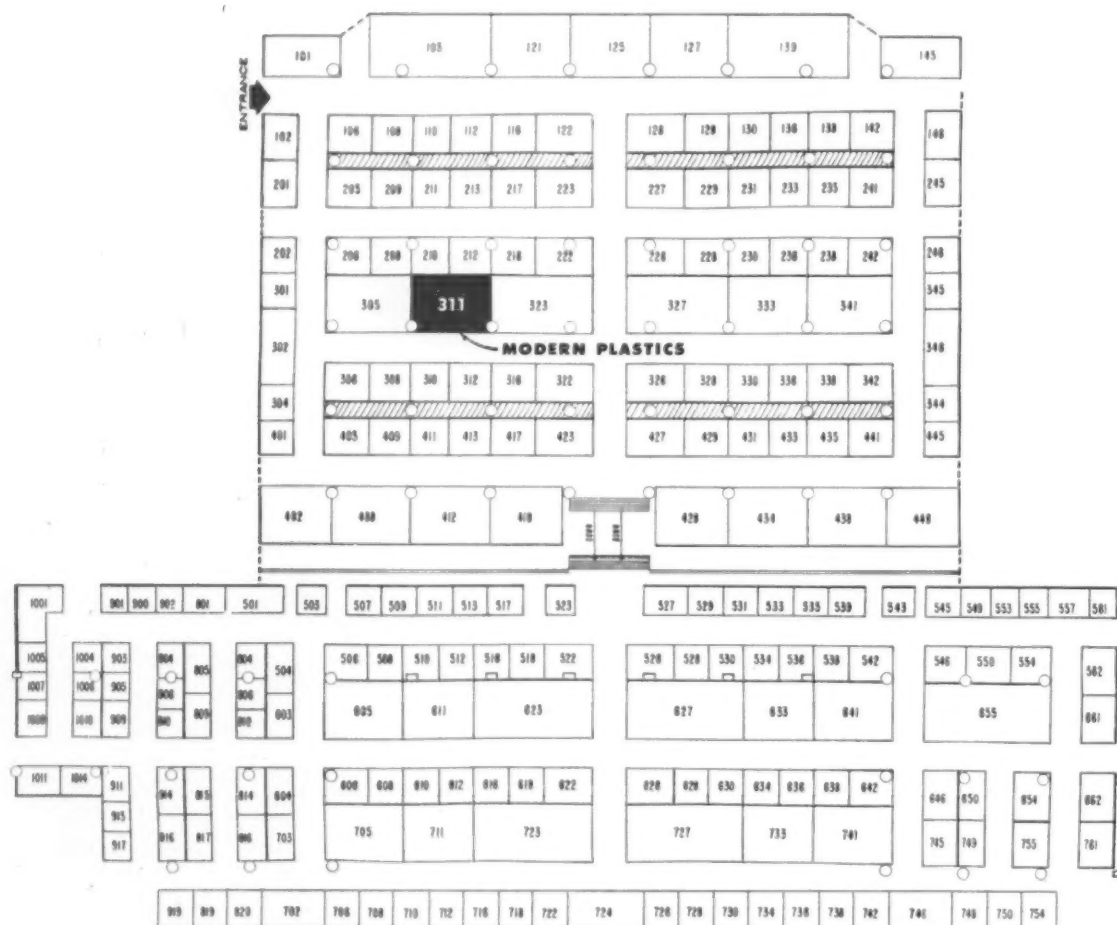
Eye-catching decorative effects are made possible by the use of styrene tile and trim on bathroom walls



Do-it-yourself kit for styrene wall tile installation contains all necessary equipment for job

Because of the workability of styrene wall tile, even such problems as sharp and round corners are easily handled by the do-it-yourself enthusiast

Floor Plan and List of Exhibitors at the 6th National



Ackerman Plastic Molding Div. of The Consolidated Iron-Steel Mfg. Co.

Booth 535. Representatives: A. F. Kuthe, Alex. Goldhof, Hadley Kline, Verna Koelliker, Lois Wilson.

Ajusto Equipment Co.
Booth 541. Exhibit: Adjustrite chairs and stools—posture seating for factory.
Representatives: David Heer, S. W. Heer, Rex Dawson, P. W. Engelsen.

American Cyanamid Co.
Booths 216, 222, 223. Exhibit: Melmac molding compounds; Beetle molding compounds; Melmac decorative laminates; Laminac polyester resins; Urac resin adhesives; Industrial, military, and consumer applications.
Representatives: R. A. Hoekelman, L. P. Moore, C. J. Romieux, W. F. White-scarver, W. N. Finney, C. W. Johnson, W. S. Sloan-man, H. W. Cyphers, Jr., H. E. Latta, D. B. McAfee, N. L. Prince, G. H. Rice, W. A. Ward, E. H. Michal, H. E. Dutot, J. Grabowski, A. T. Steele, A. L. Ramsey, R. B. Stoops, A. F. Collins, R. L. Hiller, V. E. Hasler, E. H. Trussell, J. M. Sanderson, C. J. Kaskie.

American Machinist

Booth 208. Exhibit: Publication

American Molding Powder and Chemical Corp., and A. Bamberger Corp.

Booths 136, 138. Exhibit: Ampacet molding powders and examples and illustrations emphasizing the plastics scrap reprocessing services.
Representatives: Gerald F. Bamberger, Herbert H. Goldmark, Arthur L. Metzger, Walter E. Hirtz, Joseph Foler, George W. Weir, Albert K. Speier, Harry Salad.

American Wheelabrator and Equipment Corp.

Booths 718-722. Exhibit: Wheelabrator mechanical deflashing of molded plastic parts and Liguamette wet blasting for finishing plastic molds.
Representatives: E. A. Rich, R. L. Orth, A. E. Lenhard, R. E. Schalliol, G. H. Lieser, J. R. Bunch, J. D. Alexander, C. J. Osborn, A. H. Freeman, G. F. Jones, F. E. Uhl, C. L. Benham, K. E. Blessing, V. S. Spears, G. R. Bryant, R. M. Rich, J. H. Thomson.

Amos Molded Plastics

Booth 217. Exhibit: One-piece molded parts weighing up to 122 ounces. Finishes including vacuum plating, silk screening, reverse printing,

roller coating, hot stamping, spray painting, wood-graining, etc.

Representatives: Dale Amos, J. C. Kazmier, Frank D. Deli.

Anchor Plastics Co., Inc.

Booth 534. Exhibit: Applications of extruded plastics. Samples of custom-extruded rods, tubes and shapes.
Representatives: Richard A. Fisch, Jay B. Shapiro, Franklin Dick, Robert Marx, C. B. Miller.

Apex Electrical Mfg. Co., Fibre-Glass Molding Div.

Booth 335.

Art Roll Leaf Stamping Co.

Booth 110. Exhibit: Products made of all types of plastics that are decorated by hot stamping, silk screening and offset printing.
Representatives: Arthur N. Skeels, George Davidson.

Associated Plastics Co.

Booth 814.

Auto-Vac Co.

Booth 796. Exhibit: Automatic vacuum forming machine with auxiliary drape mechanism.

Representatives: E. Bowman Stratton, Jr., E. Schneek, Richard Denny, Hugh Whitlock, E. B. Lumbard.

Avery Adhesive Label Corp.

Booths 511-513. Exhibit: Merchandising of plastic products with pressure-sensitive labels. Samples of labels.

Representatives: H. R. Smith, Amory Smith, Warren Landeck, Russ Andra, Martin Bender, Randy Brumfield, R. W. Morris.

Bakelite Co., A Div. of Union Carbide and Carbon Corp.

Booths 402, 403, 412. Exhibit: Applications molded or extruded of fluorothene, phenolics, polyethylene, polystyrene and vinyl. Vinyl rigid sheet and sheeting applications. Vinyl resins for plasticisols, organosols, coated, and foamed products. Epoxy resins for castings, encapsulating, and potting. Phenolic resins and varnishes for laminates. Polyester resins.
Representatives: C. W. Patton, R. L. Reid, J. E. Stokes, H. L. Burpo, F. W. Wurtzel, R. Cole, P. W. Wood, H. K. Phinney, F. B. Bankert, J. W. Veale, H. R. Melir, W. W. Swenson, J. M. Herbert, W. A. Messina, D. A. Munna, A. E. Donaldson, R. A. Calisbet, C. H. Strong, O. J. Johnson, J. R. Allemand, H. McGowan, J. F. Peterson, G. A. Wells, T. E. Orme, P. Groop, P. E. Rodts, R. H. Bruce, A. G. Butler, H. S. Carpenter, A. E. Maibauer, J. B. Knowles.

Baldwin-Lima-Hamilton Corp., Eddystone Div.

Booths 304, 401.

Barrett Div., Allied Chemical & Dye Corp.

Booths 730, 734, 736, 738. Exhibit: End use applications for urea, melamine, and alkyl molding compounds, industrial resins, and coating resins.

Representatives: Carleton Ellis, Sam Gurley, Jr., H. W. DeVore, E. A. Johnson, H. A. Voskamp, Jr., H. A. Hoppens, R. K. White.

Barzantni International, Inc.

Booth 914. Exhibit: Plastic extruding machine: 100 ton compression press.
Representatives: Joseph R. Barzantni, H. B. MacInnes, N. Barzantni, M. Barzantni, G. Barzantni, M. Branson, F. Barzantni, J. Honts.

Bigelow Fiber Glass Products

Booth 433. Exhibit: Fibrous glass reinforcing mats and fabrics.

Representatives: James W. Kearns, Jr., L. M. Calhoun, A. T. Dildilian, Kenneth Wood.

B. Blacher

Booth 445. Exhibit: Method of slitting and sheeting plastics materials from rolls.
Representatives: Leo Blacher, Pauline M. Blacher.

Stewart Bolling & Co., Inc.

Booth 741. Exhibit: 6- by 13-in. laboratory plastic mill; 2½- by 7-in. dual laboratory midget mill and cracker; 8- by 16-in. 4-roll laboratory plastic calender; 18- by 18-in. 100-ton plastic transfer type molding press.
Representatives: Stewart Bolling, S. N. Bolling, J. G. Grimm, J. T. Matsuka.

Bolta Corp.

Booth 917. Exhibit: Boltaron low-pressure sheet stock 6100, 6200, 6700-A and the new 7100 Series.
Representatives: Carl E. Holch, Arthur E. Read, Richard S. Cole.

The Borden Co., Chemical Div.

Booth 557. Exhibit: Actual molding of Durite GP-102. End products using Durite phenolic molding compounds, industrial resins and lamp basing cements.
Representatives: E. L. Kraft, W. J. McIntosh, C. E. Markhoff, E. M. McElligott, T. R. McLaughlin, J. F. Moroney, D. H. Sanders, C. R. Smith.

Catalin Corp. of America

Booth 641. Exhibit: Synthetic resins and styrene molding powders.
Representatives: W. D. Breanley, V. W. Moss, P. A. Krentel, F. E. Hadley.

Celanese Corp. of America, Chemicals Div.

Booth 336. Exhibit: Plasticisers and solvents for use in the plastics industry.
Representatives: R. H. Kamp-schulte, N. G. Baker, J. D. Couig, W. C. Goodwine, T. G. Davis, D. D. Hecht, E. Holmstrom, R. A. Schwab, R. J. Werner, C. A. Aichler.

Celanese Corp. of America, Plastics Div.

Booths 327-333. Exhibit: Application of acetate sheets, films, and molding compounds.

polyethylene film and sheeting, and Marco polyester resin products.

Representatives: O. G. Ball, H. M. Balter, L. Birzstein, R. L. Campen, D. P. Clarke, E. V. Clarke, D. Cowan, P. J. Dunn, L. Eckler, C. J. Feltz, J. W. Flynn, J. T. Growley, W. E. Holland, D. A. Jones, H. I. Kalde, G. A. Katus, M. S. Kirpalani, J. J. Keville, Jr., K. W. Kithil, H. B. Leinbach, R. M. Leiter, J. J. MacFarland, W. P. Moeller, S. W. Murray, W. M. Porter, W. R. Porter, H. Raymond, M. Reynolds, E. H. Robnett, R. J. Savage, E. W. Smith, C. A. Snodgrass, L. Stevens, E. W. Ward, W. K. Woodruff.

Chicago Molded Products Corp., Campeco Div.

Booths 129, 130. Exhibit: Products formed from Campeco rubber-styrene sheet and other molded products.

Representatives: John J. Bachner, J. E. Johnston, B. L. Attig, J. W. Stokes, E. F. Bachner, Jr., R. F. Hrudka, J. L. Bachner.

Ciba Company, Inc.

Booth 702. Exhibit: Applications of epoxy resins.

Representatives: J. R. Charlton, D. M. Joseph, J. Durra, E. Dorman, G. M. Seales.

Claremont Pigment Dispersion Corp.

Booth 546. Exhibit: Nylon-to-vinyl adhesives; conventional-type ions; dry vinyl-pigment dispersions; color pastes; vinyl ink prints.
Representatives: Mr. Mark W. Neithlich, Murray Marlowe, Hal Curtis Felsher.

Cleveland Plastics, Inc.

Booth 536. Exhibit: Plastic wall tile and refrigerator parts.
Representatives: Frank Cermak, D. Marcy, J. Copeland, Jacqueline Rudolph.

Cleworth Publishing Co., Inc.

Booth 142. Exhibit: Publication
Representatives: C. Wm. Cleworth, George Rhine, Wm. B. Cowilich, Paul Fincher, Dudley Trott, Frank C. Mahanke, Richard Ahrens.

Clifton Hydraulic Press Co.

Booth 905. Exhibit: Unitrol hobbing press featuring pipeless hydraulic system.
Representatives: Ed McDaniels, Earl Brandes.

Coating Products

Booth 328. Exhibit: Metallic acetate, butyrate and polystyrene.
Representatives: M. M. Mainthow, J. Abrams, R. Goodman, G. Newcomer, C. Olson.

Colonial Plastics Div., Van Dorn Iron Works

Booth 202. Exhibit: Molded nylon, lucite, polyethylene, cellulose, styrene, and vinyl products. Unplasticized P. V. C. pipe, pipe fittings, tanks, and duct work.
Representatives: James E. Jones, Granville H. Shirley, William Hatfield, Charles R. Owen, William J. Anderton.

Conforming Matrix Corp.

Booths 309, 310. Exhibit: Spray painting masks, fixtures, mask washing machines, and automatic spray painting machines.

International Plastics Exposition, June 7th through 10th.

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Representatives: Hamilton E. MacArthur, E. M. MacArthur, Milton T. Schimmel, A. J. Spelker, G. D. Minnick, E. L. Faber, William Czebatul, A. M. McIntire.

Consolidated Molded Products Corp.

Booth 413. Exhibit: Molded plastic products.
Representatives: J. O'Connell, J. W. Pillinger, F. W. Luther, C. H. Dickman, C. E. Beacham, C. K. Swartz.

Consolidated Vacuum Corp.

Booth 146.

Cumberland Engineering Co., Inc.

Booth 562. Exhibit: Cumberland Model 20 plastics granulating machines; Cumberland stair-step dicing machine.
Representatives: Robert R. Lange, Jr., Charles Drummond, Beaupre McElaney.

D-M-E Corp., Div. of Detroit Mold Engineering Co.

Booth 816. Exhibit: Standard mold bases, ejector pins, and mold components. Mold makers' supplies and mold polishers' supplies.

Representatives: L. J. Morrison, Sherman Crawford, Julius Mate, E. B. Soules, Tom Cassidy, Bill Kosobud, Bob Fox, Frank S. Marra.

Daily News Record

Booth 504. Exhibit: Publication.
Representatives: Kenneth Howry, E. P. Laskey, Ben Sonz, Bertha Kaufman, John W. Martin.

Dake Engine Co.

Booths 726, 728. Exhibit: Semi-automatic compression molding press.

Representatives: Paul A. Johnson, Jr., C. N. Jacobson, H. Harold Poort, Donn De Young.

DeMattia Machine and Tool Co.

Booth 226. Exhibit: 12-oz. injection molding machine.

Representatives: J. L. Hutchings.

The Dow Chemical Co.

Booth 627. Exhibit: Over 70 applications of saran, polyvinyl chloride, Ethocel, Styrofoam and Styron in 8 different formulations.
Representatives: J. B. Casey, M. F. Christensen, Keith Williams, John Fleischmann, D. L. Gibbs, D. R. Eby, C. F. Cummins, D. W. McCuaig, J. A. Jones, H. F. Schnepf, H. F. Schnepf, Jr., A. L. Ruddock, Gage Olcott, V. Eicholtz, A. H. Baum, R. V. Urfem, R. W. Beckwith, W. J. Monahan, J. B. Rutherford, A. A. Butterworth, P. W. Simmons, F. J. Ward, C. J. Birkmaier, L. J. Bub, F. C. Kenyon, F. V. Duffy, P. M. Jensen, T. M. Gow, C. C. Waldbillig.

E. I. du Pont de Nemours and Co., Inc., Film Dept.

Booth 501. Exhibit: Applications of Mylar polyester film.
Representatives: Arnold Kneitel, Jack Wilkins, D. D. Lansing.

E. I. du Pont de Nemours and Co., Inc., Polychemicals Dept.

Booths 605, 611. Exhibit: Applications of nylon, Alathon polyethylene, Lucite acrylic, and Teflon.

Durez Plastics & Chemicals, Inc.

Booths 246, 345, 346. Exhibit:

Phenolic molding materials and resins and their applications.

Representatives: A. W. Hanmer, Jr., F. Rowley, E. E. Woodman, E. F. Borro, Jr., A. Wandschneider, H. Frankenfelf, G. Shroyer, H. M. Dent, Jr., E. F. Borro, Sr., R. E. Dodd, J. W. Ferguson, F. W. Less, Dr. J. Searer, H. B. Puff, O. Beardmore, M. Dubenitz, K. Fuoco.

Eastman Chemical Products, Inc.

Booths 105, 121. Exhibit: Tenite butyrate materials and their applications.

Representatives: G. W. Carpenter, W. F. Cooper, Jr., T. E. Dudley, C. B. Fox, Jr., W. R. Groover, D. C. Guthrie, J. F. Hill, T. H. Howard, R. P. Johnson, T. L. Loveless, J. M. Marvin, J. E. McKenzie, F. R. Meredith, H. D. Moore, J. T. Moore, H. D. Oliver, Jr., J. R. Pecktal, H. Reebel, W. L. Searles, J. G. Slater, N. C. Taylor, A. B. Thurman, W. H. Weaver, K. A. Wheeler, D. C. Williams.

Frank W. Egan & Co.

Booth 344. Exhibit: Extrusion and allied handling equipment.

Representatives: R. C. Sturken, L. W. Egan, W. H. Willert.

Elmes Engineering Div., American Steel Foundries

Booth 705. Exhibit: 100-ton glass fiber compression molding press and 30-ton and 50-ton air operated Hydrolair.

Representatives: G. Marakas, J. W. Tomka, H. Miller, R. Dorenbos, R. Gillis, M. Stafford, W. Westfall, P. Johnson.

Emery Industries, Inc.

Booths, 712-716. Exhibit: Chemicals of interest to plastic processors with emphasis on low-temperature vinyl plasticizers, particularly the azelate diesters.

Representatives: R. F. Brown, R. T. Hull, W. T. Meinert, J. D. Farr, A. C. Fusaro, J. W. Ritz, D. R. Eagleson, J. A. Funk, W. J. Siemens, W. C. Sowers.

Engineered Nylon Products, Inc.

Booth 910. Exhibit: Molded nylon parts.
Representatives: James F. Wyllie, William H. Drinkall, George R. Wyllie, Gregory Tyack.

The Englander Co., Inc.

Booth 703. Exhibit: Custom molded and fabricated products.
Representatives: R. J. Guerin, E. P. Cizek, A. H. Raciti.

Erie Engine and Mfg. Co.

Booth 711.

Erie Resistor Corp.

Booth 209. Exhibit: Molded and formed products.
Representatives: W. H. Fryling, W. C. Conroy, S. W. Duncan, W. J. Brosman, E. C. Smith.

The Exact Weight Scale Co.

Booth 749. Exhibit: Automatic and semi-automatic weighing machines; heavy duty weighing machines.
Representatives: W. A. Schuerer, W. J. Schieser, R. W. White, J. E. Konkle, R. W. Grant, Dave E. Deeley, John Kelly,

J. F. Baldwin, Harry Baumgardner, Roy S. May.

Farley & Loetscher Mfg. Co., Plastics Div.

Booth 503. Exhibit: Farlite decorative laminates, panels, and tops, including restaurant type tops, dinette tops, counter tops and bar tops.
Representatives: Fred R. Loetscher, C. E. Walz, E. H. Alexander.

The Fellows Gear Shaper Co.

Booths 405, 409, 411. Exhibit: Injection molding equipment.
Representatives: F. C. Means, J. Hronek, F. Zumstein, D. E. Flint, George Thompson, Howard Farnsworth, W. G. Parker, R. B. Currie.

Ferro Corp.

Booths 429, 431. Exhibit: Ferro plastics colors: Uniformat fibrous glass reinforcing mat.

Fibersin Plastics Co.

Booth 301. Exhibit: Melamine surfaced plastic board stock for school, contract and domestic furniture.
Representatives: David M. McCalla, John M. Daggett.

Fiberite Corp.

Booth 211. Exhibit: High impact phenolic and melamine molding compounds.
Representatives: John E. David, Paul Bury, Paul Fina, Ed. Keusch, Dave Sharpe.

Finish Engineering Co., Inc.

Booths 662, 761. Exhibit: Spray painting masks; semi-automatic and automatic spray painting and masking machines; and other decorating equipment.
Representatives: Robert B. Way, Carl D. Hersey, Clifford V. Scantlebury.

Firestone Plastics Co.

Booth 341. Exhibit: Liquid circulating system; typical blower unit for venting acid fumes; Exon coatings.
Representatives: R. W. Briner, J. R. Bukey, H. E. Cooper, F. J. Groten, T. A. Henry, L. B. Kuhn, B. K. Lyckberg, J. McIntyre, G. Sollenberger, T. Zawadzki.

Foremost Machine Builders, Inc.

Booth 666. Exhibit: Plastics processing equipment, including scrap grinder.
Representatives: Dewey Rainville, Arthur Rainville, Tom Ryan, Nick Gerten.

General American Transportation Corp.

Booth 305. Exhibit: Custom molded thermoplastics, thermosetting, and reinforced plastics applications; vacuum formed products.
Representatives: Frank E. Selz, Arthur N. Williams, Elmer Layden, Harry M. Jenkins, James Nash, Carl E. Holmes, John D. Braught.

General Electric Co., Chemical Div.

Booths 326, 427. Exhibit: Phenolic and polyester resins; compression and injection molding services; molded Mycalex and silicone rubber parts; industrial and decorative laminated plastics.

The General Industries Co.

Booth 213. Exhibit: Thermoplastic, thermosetting, compression and plunger transfer molded castings.

Representatives: J. M. Callihan, E. J. Rothgery.

Glengarry Equipment Corp.

Booth 801. Exhibit: Weigh-feeding equipment.
Representatives: C. W. Lang, J. E. Currie, Ed Buechner, Les Kent.

B. F. Goodrich Chemical Co.

Booth 727. Exhibit: Finished products made from Geon polyvinyl materials.

Representatives: G. A. Fowles, J. L. Foster, H. M. Zimmerman, C. A. Clark, R. E. Welch, G. G. Rothman, G. S. Garvin, R. T. Holtz, W. E. Manning, C. D. Segner, J. F. Malone, E. E. McClellan, R. C. Bascom, W. D. Parrish, H. E. Minnerly, M. W. Osborne, Jr., R. P. Blaine, J. E. Pittenger, O. E. Isenburg, J. S. Richards, G. B. Koch, J. W. Misamore, L. H. Williamson, J. A. Amos.

Goodyear Tire & Rubber Co., Chemical Div.

Booth 125. Exhibit: Plio-Tuf high impact resins and Plovic vinyl resins—physical properties, processing characteristics, and typical end products.
Representatives: H. N. Thies, R. T. Hickcox, J. W. Bear, J. M. Huasey, D. E. Neese, R. R. Kann, J. E. Warner, W. F. Gerrow, J. R. Guillem, R. E. Workman, C. O. McNeer, M. J. Rhoad, A. E. Polson, J. F. Carraher, E. C. Brown, R. S. Earhart, J. R. Houlette.

Goodyear Aircraft Corp.

Booth 205. Exhibit: Laminated reinforced plastic parts; fabricated acrylic parts.
Representatives: Fred W. Dover, C. M. Downey, R. W. Dunmire, B. D. Raffel, J. K. Burkley, W. J. Hampshire, W. C. McDonald, D. Cully, P. L. Gitter, W. Kroeger.

The C. L. Gougler Machine Co.

Booth 748. Exhibit: Model FG80 compression press for molding reinforced plastic parts; cast steel; matched metal mold for molding reinforced plastic bath tub.
Representatives: John C. Moricoli.

W. C. Hardesty Co., Inc., Chemical Div.

Booth 508, 510.

Hartig Engine and Machine Co.

Booth 554. Exhibit: Plastic extrusion machine.
Representatives: Edward Greene, L. D. Yokana, W. R. Dannheim.

Hendrick Mfg. Corp.

Booth 555. Exhibit: Panel saw for cutting large sheets of plastic.
Representatives: R. W. Hendrick.

Hercules Powder Co.

Booths 201, 102. Exhibit: Application of Herculac cellulose acetate molding powder and cellulose nitrate for home, industry, and personal use.
Representatives: L. P. Barnette, P. Belk, W. O. Bracken, George Bossert, Werner Brown, Edward Cronin, Richard Huber, J. B. Martin, S. Thompson, J. Skelly, Jr., C. Wenger.

Hobbs Mfg. Co.

Booth 750. Exhibit: Constant tension rewinding of polyethylene, cellophane, etc.

Representatives: Stewart F. Oakes, George B. Clay, Howard K. Lambert.

Hooker Electrochemical Co.

Booth 230. Exhibit: Fire-resistant polyester resins.
Representatives: Charles Y. Cain, John P. Edwards, Carl I. Gochenour, Robert J. Entenman, Alexander L. Blackwell.

Hurlbut Paper Co.

Booth 531. Exhibit: Resin saturating base and overlay papers for use in plastic laminates.
Representatives: Edward A. Sitzer, James M. Burt, Lester L. R. Phillips, James M. Farnum, Dr. Hanns F. Arletter.

Hydraulic Press Mfg. Co.

Booth 655. Exhibit: 6-oz. injection molding machine and 24-oz. injection molding machine.
Representatives: R. W. Powell, Robert Vaughn, B. D. Ashbaugh, John Parks, William Croll, R. E. Davis, C. P. Terry, A. S. Lenzell, E. Oehling, T. G. Bishop.

Improved Machinery Inc.

Booths 210, 212. Exhibit: Impeco Model HA2-65, 2-oz. injection molding machine.
Representatives: George W. Whitehead, H. M. Allard, Frank Z. Bailey, George G. Doughty, Lyle V. Burford, Hibbert W. Moss.

Industrial Mfg. Corp.

Booths 616, 618.

Instron Engineering Corp.

Booth 302. Exhibit: Universal testing instrument and integrator.
Representatives: Harold Hindman, George Burr, Henry Cook.

Interchemical Corp., Finishes Div.

Booth 603. Exhibit: Applications of polyester resins and color concentrates in fabricating reinforced plastic parts; foamed vinyl plastisol.
Representatives: Samuel A. Moore, Chester M. Robbins.

International Balsa Corp.

Booth 901. Exhibit: Balsa wood as a core material for reinforced plastic construction.
Representatives: Prem Gary, S. Greenhouse.

International Molded Plastics, Inc.

Booth 509.

The M. W. Kellogg Company, Chem. Mfg. Div.

Booth 127. Exhibit: Applications of Kel-F polymer molding powders, dispersions, oils, greases, and waxes. Quality control tester for trifluorochloroethylene plastics. Anti-corrosive "baked-on" coatings based on Kel-F polymers.
Representatives: Walter J. Merck, Louis Rubin, J. A. Jupa, S. W. Jones, D. W. Towler, L. J. Fitzharris, F. M. Ruggles, C. Giannotta, C. T. Leder, F. J. Honn, C. Dittmer.

H. Kohnstamm and Co., Inc.

Booth 533. Exhibit: Colorants for molding compounds.
Representatives: Frank V. O'Neil, J. Tarter, G. Sloane, W. Olson, P. Kohnstamm.

Koppers Co., Inc.

Booth 418. Exhibit: Applications of Fibertuff glass fiber reinforced plastics and two new polystyrene plastics. Expandable polystyrene foam.

W. T. La Rose and Associates, Inc.

Booth 223. Exhibit: Thermal high-frequency preheating equipment.
Representatives: J. T. Arnold, J. F. Trembley, V. S. Wagner, S. T. Miles, J. E. McCabe.

Lester-Phoenix, Inc.

Booths 417, 423. Exhibit: L-2-12-oz. Lester injection molding machine.
Representatives: H. E. Bollinger, H. H. Jock, D. White, D. Sloane, W. Schwartz, A. B. Geers, Sydney W. Lohman, Thoreson-McCosh, Inc., Joseph J. Schmidt, Don W. Williams, E. C. Mast, Steven F. Drould, Seaboard Machinery Co.

Lewis Welding & Engineering Corp.

Booth 434. Exhibit: Injection molding machines.
Representatives: J. T. Lewis, Jr., W. A. Pearce, Jr., C. E. Miller, B. A. Weisend.

Libbey-Owens-Ford Glass Co., Fiber Glass Div.

Booth 542. Exhibit: Garan Roving. Garanzed cloth, and chopped strand.
Representatives: C. F. Hegg, D. W. Lyon, G. L. Smead, Don McAnally, N. P. Kimberly.

Loven Chemical of California

Booth 806. Exhibit: Phenolic resin and applications.
Representatives: H. C. Millerburg, Abe Bloom.

MacDonald Mfg. Co.

Booth 538. Exhibit: Samples of injection molded thermoplastic materials.
Representatives: Stuart MacDonald, J. H. Kuhn, P. J. Carolin, George Wessel, James Wood, Kenneth Meldrum.

Machine Design

Booth 512. Exhibit: Publication.

P. R. Mallory Plastics, Inc.

Booths 911, 915. Exhibit: Conversion plasticizer on a typical injection press.
Representatives: A. R. Taggart, F. J. Krone, L. M. Summers, W. H. Coffing, Leo Paszkiet, John Paszkiet.

Manco Products, Inc.

Booth 529. Exhibit: Tru-Cast beryllium copper mold components.
Representatives: M. A. Nichols, J. P. Healey, John C. Reib.

The Marlette Corp.

Booths 634, 636, 733. Exhibit: Manufacturing process and finished products of cast phenolic resin. Industrial resins; draw dies, stretch plugs, etc. made from casting resins.
Representatives: Robert A. Grayson, Philip Mackinson, John Omaggio, Max Hilrich, Dumont Andersen, Bernard Trachtman, Frank Bogart.

Markem Machine Co.

Booth 550. Exhibit: Industrial marking machines.
Representatives: S. W. Ray-

mond, D. F. Putnam, E. C. Mensel.

Mason, Shaver & Rhoades
Booth 909. Exhibit: Precision parts molded of nylon, glass-filled alkyds, and other plastics.
Representatives: C. R. Rhoades, A. W. Roethlisberger, I. H. Price, T. Hinkley.

Materials & Methods
Booth 101. Exhibit: Publication.

Mayflower Electronic Devices, Inc.
Booth 805. Exhibit: Heat sealing equipment.
Representatives: E. J. Wohl-farth, J. Stewart, H. Coleman, R. Meenen.

McGraw-Hill Publishing Co.
Booth No. 208.

Metal and Thermit Corp.
Booth 507. Exhibit: Vinyl products in which metal & Thermit stabilizers and flame retarders are used.
Representatives: F. J. O'Brien, Jr., H. W. Buchanan, E. M. Tinnon, B. Brooks, H. E. Hirschland, M. L. Smith.

Midwest Plastic Products Co.
Booth 650. Exhibit: Thermo-plastic sheet stock and end uses.
Representatives: C. C. Whitacre, E. E. Eckenbeck, E. E. Eckenbeck, Jr., T. Lumbard.

The Miskella Infra-Red Co.
Booth 543. Exhibit: Infra-red dryers, ovens, and other high-heat units.
Representatives: W. J. Miskella, G. A. Miskella, R. Sloan, F. Zitek, W. Roberts.

Modern Plastic Machinery Corp.
Booth 916. Exhibit: Demonstration by photographs of various extruders and equipment.
Representatives: Neill Rothacker, Ed Tanis, Stanley Bloyer and W. J. Johnson.

Modern Plastics
Booth 311. Exhibit: Publications.
Representatives: C. A. Breskin, A. S. Cole, T. B. Breskin, P. W. Muller, H. Friedman, P. H. Backstrom, M. A. Olsen, B. W. Gussow, S. S. Siegel, J. M. Connors, W. F. Kennedy, R. C. Beggs, J. C. Galloway, H. McCann, A. P. Peck, F. B. Stanley, R. L. Van Boskirk, V. Wright, J. Frados, I. Gross, P. P. Philipson.

Molded Fiberglass Co.
Booth 642. Exhibit: Custom molded reinforced plastics products.
Representatives: P. M. Pangman, H. Gordon.

Monsanto Chemical Co., Plastics Div.
Booths 516, 517, 518, 522, 523, 524, 527, 528, 530. Exhibit: Lustrex Hi-test 88 high impact styrene plastic; Opalon vinyl paste resins for fabric and paper coating, and slush molding; Resinox phenolic molding compounds; and phenolic resins for foundry applications.
Representatives: R. C. Evans, E. L. Hobson, E. D. Kennedy, D. S. Plumb, E. S. Bauer, T. S. Lawton, M. G. Caine, D. Guarnaccia, E. V. Hellyar, S. L. King, F. E. Woodill, C. L. Richards, J. S. Miller, E. S. Childs.

Moslo Machinery Co.
Booth 724. Exhibit: Model 73, 1/2-oz. and Model 80, 3/4-oz. high-speed fully automatic plastic injection molding machine.
Representatives: Ernest P.

Moslo, B. J. Moslo, H. W. Green, Harlan Stanley, Emmett D. Frank.

J. M. Nash Co.
Booth 626. Exhibit: Multi-spindle finishing machines.
Representatives: A. Kluge, G. McGuire, R. Green.

National Research Corp.
Booth 608. Exhibit: Vacuum coaters.

National Rubber Machinery Co.
Booth 245. Exhibit: Plastic extruder with typical extruded sections.
Representatives: W. G. Potts, H. E. Buecken, E. E. Hes-ton, C. S. Gilbert.

Naugatuck Chemical Div. of U.S. Rubber Co.
Booths 438, 446. Exhibit: Marvinol vinyl resins; Vibrin polyester resins; Kralastic molding powders; products and processes demonstrating outstanding advantages of these three types of raw materials.
Representatives: W. H. Mac-Hale, Herb Bendel, Frank Molen, Curt Colby, Walter Peacock, Al Herring, Bud Crawford, Art Thomas, Claude Allard.

New Hermes Engraving Machine Corp.
Booth 904. Exhibit: Engraving machines for the plastics industry.
Representatives: G. Gruettner, M. Kaufman, J. Beggs.

Nylon Molded Products Corp.
Booth 638. Exhibit: Molded nylon for industrial applications.
Representatives: Gilbert J. Stein, Sylvan H. Rosenfeld, George E. Beckett, Edward L. Matosich.

Omni Products Corp.
Booth 206. Exhibit: The company's function of making available plastics materials, machinery, and methods, particularly in relation to reinforced plastics, from leading American sources through world-wide network of offices and agencies.
Representatives: Tino Perutz, Robert Ernst, Walter Geber.

Owens-Corning Fiberglass Corp.
Booth 428. Exhibit: Fibrous glass reinforcement.

Pittsburgh Coke & Chemical Co.
Booths 238, 242. Exhibit: Pittsburgh PX Plasticizers.
Representatives: Henry Avery, D. J. MacLennan, E. H. Shaw, G. J. Esselen, III, W. H. Daub, Jr., L. N. Holden, Jr., J. F. Hall, Jr., Dr. W. D. Schroeder, N. L. Perry, M. B. Sharp, D. J. Killian.

Plastics Engineering Co.
Booth 633.

Plax Corp.
Booths 106, 108. Exhibit: Oriented polystyrene (Polyflex); oriented methacrylate (Methaflex); formed Polyflex and Methaflex; polyethylene and cellulose acetate butyrate bottles.
Representatives: George Pickering, C. Paul Fortner, James H. Parلمان, J. Gordon King, Miss Rena Pasqualini, R. Muller, D. Hayes, William Gamron, A. Todd, John Carlisle, R. Minogue.

Polyplastex United, Inc.
Booths 628, 630. Exhibit: Decorative plastic sheets—laminates, coatings, etc.
Representatives: H. W. E. Riley,

R. W. D. Heins, Charles Futry.

Product Engineering
Booth 208. Exhibit: Publication.

Pyro Plastics Corp.
Booth 746.

Radio Receptor Co., Inc., Ther-matron Div.
Booth 126. Exhibit: Electronic heating and sealing equipment for plastics.
Representatives: Ivan H. Schwartz, Harold N. Kron-gold, Martin Dorfman, Herman Jongbloed, Peter Black.

Reed-Prentice Corp.
Booths 112, 116, 122. Exhibit: 4-oz. and 12-oz. injection machines in production.
Representatives: F. W. McIntyre, Sr., F. W. McIntyre, Jr., I. G. Freeman, I. J. Freeman, C. Holland, R. Carr, D. Eaton, E. Brierly, J. D. Sherman, W. H. Elliott.

Reeves Pulley Co. Inc.
Booth 145.

Regal Plastic Co.
Booth 622. Exhibit: Fabricated plastics, including polystyrene refrigeration parts, reinforced plastic cases.
Representatives: J. S. Kivett, P. J. Coverdale, Paul Lux, Mike Gallagher, C. W. Nelson, Robert List, W. A. Johnston.

Reichhold Chemicals, Inc.
Booth 623. Exhibit: End uses of polyester resins, varnishes for decorative and industrial laminates, resins for shell molding and core bonding, resin insulation binders and resin binders for abrasive wheels.
Representatives: M. K. Pinkerman, H. Kline, C. B. Breed-love, G. D. Lamont, C. W. Helmrich, Jr., C. L. Hose, I. H. Schupp, E. A. Terray, D. G. Patterson, R. R. Cook, A. L. Wooten, H. Raech, Jr., J. M. Sweeney, F. C. Gros-jus, Jr., H. H. Reichhold, R. H. Coerd, R. W. Thuem-ler, Gene Scala.

Reinhold Publishing Corp.
Booth 101. Exhibit: Publication.

Rezolin, Inc.
Booth 1914. Exhibit: Toolplastik phenolic casting resin; ethylcellulose material for high impact metal forming with Ceeo stamp and drop hammer; phenolic foam material for core structures, epoxy type laminating resins, and casting resins.
Representatives: Lee R. Miller, George C. Adams, Appy Juras.

The Richardson Co.
Booth 330. Exhibit: Molded products, laminated sheets, rods, tubes, fabricated parts, storage battery parts.
Representatives: Robert W. Jorgensen, L. V. Comeford, R. E. Noggle, J. H. Ehr-hardt, Ralph Waggoner, J. B. Loesing, Jr., Lou Barry, C. E. Rank, Harry Froelich, Lloyd Connors, J. C. Rich-ardson.

Roehlen Engraving Works, Inc.
Booth 606. Exhibit: Embossing rollers.
Representatives: H. S. Vohs, L. R. Vohs, C. R. Kerrigan, G. R. Weinman.

Rohm & Haas Co.
Booths 227, 229, 231, 233, 235, 241. Exhibit: Plexiglas molding powder—properties and applications in various fields; Plexiglas sheet—applications in in-

terior lighting, street lighting, outdoor signs, and glazing and daylight control for industrial plants; Applications of Paraplex polyester resins; Paraplex plasticizers used in vinyl products, including plastic tile, shower curtains, garden hose, etc.
Representatives: R. R. Rorke, D. S. Plume, R. L. Gard-ner, D. A. Rothrock, A. R. McFarland, W. F. Condon, R. Schacht, R. J. Neu, D. G. Stewart, Jr., M. L. Blumenfeld, O. L. Pierson, W. E. Wirsch, F. G. Felske, W. H. Gibson, C. B. Bennett.

Royal Master, Inc.
Booth 906. Exhibit: Royal Master TG-12 Centerless Grinder; Royal Master PG-7 Centerless Form Grinder.
Representatives: Ervin C. Peake, Robert C. Barhorst, Joseph DeMasi.

Russell Reinforced Plastics Corp.
Booth 236. Exhibit: Applications of reinforced plastics laminates.
Representatives: A. W. Russell, Dan B. Hains, E. J. Selzer, Fred Turner, Ernest C. Schultz.

The Safety Car Heating and Lighting Co., Entoleter Div.
Booth 553. Exhibit: Centrifugal mixers and grinders.
Representatives: R. J. Hoskins, A. T. Drake, J. N. Mees.

Shell Chemical Corp.
Booth 228. Exhibit: Commercial products based on diallyl phthalate resin in molding compounds and laminates; applications of Epon resins in laminates, castings and potting.
Representatives: W. W. Williams, D. F. Haberkost, G. S. Shaw, F. T. Watson, H. Chorney, K. R. Fitzsimmons, T. G. Nock.

South Florida Test Service
Booth 742. Exhibit: Facilities and services offered for actual weather testing of all types of plastic materials.
Representatives: Earl M. De-Noon, Warren W. Smith.

Spencer Chemical Co.
Booth 904. Exhibit: Photographs of plants in operation and in construction.
Representatives: William Schop-flin, Frederick C. Sutro, Jr., Gordon Crowe.

Sterling, Inc.
Booth 506. Exhibit: Mold temperature control equipment.
Representatives: Paul A. West, John B. Ballard, Bernard Alexander, Charles H. Her-rick, C. H. Whitlock, Dewey Rainville, Frank Bridges, Lloyd Qually.

F. J. Stokes Machine Co.
Booth 139. Exhibit: Compression molding press; injection molding press; twin screw extruder; and vacuum metallizer.
Representatives: David Stokes; Quentin White, A. A. Hutch-ings, R. U. D. Strong, E. Fitzpatrick, Frank Arpaian, Frank Cramton, Harold Cole, Jay Steiner, Malcolm Adler, Thomas Allechin, Robert Krause, Ted Bebrecenti, Stewart Helliwell, William Henneman, James Morris-sy, Richard Voelz, Edward Ritter, William Robinson, Ray Anderson, John Cole-man, Walter Rayher, Harold Roman, Harry Walp, Ralph

List of Exhibitors, Contd.

Stalbaum, Samuel Green-wood, Lawrence Morehouse, Fred Hillsley, Joseph Rob-ertson.

M. Swift & Sons, Inc.
Booth 604. Exhibit: Hot die stamping with gold, bronze and pigment colors on plastic surfaces.
Representatives: C. W. Bor-cherding, J. B. Alogna, J. G. Swift, C. E. Woodward.

Ralph B. Symons Associates, Inc.
Booths 819, 820, 918. Exhibit: Dowling injection molding machine; Bipel horizontal hydraulic pelletter; and Bipel compression press complete with transfer cylinder.
Representatives: Ralph B. Symons, William A. Shilling, Victor Humphrey, John Beard.

Tenco, Inc.
Booth 708. Exhibit: Plastic pipe fittings.
Representatives: R. J. Harken-ridar.

Thermaflow Chemical Corp.
Booth 539. Exhibit: Articles fabricated of fibrous glass reinforced plastics.
Representatives: Richard F. Doayne, James Lake Harvey.

Thermal, Inc.
Booth 810. Exhibit: Electric heating units; Thermo-bands; Thermo-platen; and high-watt density Thermo-cartridges.
Representatives: W. H. Norton, D. H. May, Mel Konrad.

Theratron Div., Radio Re-ceptor Co., Inc.
Booth 126. Exhibit: Electronic heating and sealing equipment.
Representatives: I. H. Schwartz, H. N. Krongold, M. Dorf-man, H. Jongbloed, P. Black.

Tote System, Inc.
Booth 654. Exhibit: Bulk material handling equipment for the plastics industry.
Representatives: C. D. Ackerman, F. J. White, Jr.

Tracerlab, Inc.
Booth 549. Exhibit: BG-5 light materials beta gauge.
Representatives: John J. Pen-nock, William McCarthy, Jack Carlin.

U. S. Industrial Chemicals Co., Div. of National Distillers Products Corp.
Booth 738. Exhibit: Four polyester resins for molding fibrous glass reinforced plastic parts: Aropol 7100, 7110, 7200, and 7300 type resins.
Representatives: L. A. Keane, M. M. Gruber, C. S. Stryker, W. Dodds, J. Hinz, F. Hinz, G. Smith, A. Olotka, J. Greenfield.

U. S. Rubber Co., Royaltie Plastic Products
Booths 901, 902. Exhibit: Roy-alite products.
Representatives: T. R. Grimes, R. K. Buffington, A. J. Parkau.

Vacumet, Inc.
Booth 817. Exhibit: Vacuum plating of plastics; metallic coatings for plastics.
Representatives: Philip Pinosof, Harold Weinstein.

Vacuum Forming Corp.
Booth 755. Exhibit: Model 50-20 operating on drape forming process.
Representatives: Sanford S. Zimmerman, Rudolf Kreidel.

The Van Dorn Iron Works Co., Plastics Molding Machine Div.

Booth 306. Exhibit: Injection molding machine; plastic scrap granulator, samples of products made on Van Dorn equipment.
Representatives: J. J. Reichel, H. H. McNash.

Vin-Rock, Inc.
Booth 903. Exhibit: Vin-Roc V-1 and R-2 mold releases.
Representatives: Elmer Rocker, Jules Vinney, A. C. Palm, Mort Soss, R. S. Lee, Charles Voracek.

John Waldron Corp.
Booth 342. Exhibit: Coating machine in operation; photos of coating, laminat-ing, and embossing machines.
Representatives: D. G. Higgins, O. W. Grant, B. R. Newcomb, C. J. Waechter, A. W. Willenbrock.

Watson-Stillman Co.
Booth 723. Exhibit: Two injection molding machines in operation. (1) New 5-oz. fully automatic horizontal injection. (2) 16-oz. horizontal injection molding.
Representatives: Sales force and executives.

Welding Engineers, Inc.
Booths 610, 612. Exhibit: Com-pounder extruder model 2052V.
Representatives: W. H. Duncan, H. M. Harris, L. H. Heist, Jr., M. F. Loetterle, R. H. Skidmore, L. F. Street, D. M. Tourison.

West Instrument Corp.
Booth 815. Exhibit: Temperature controllers and indicators.
Representatives: R. K. West, A. M. Wiler.

Westchester Plastics, Inc.
Booth 435. Exhibit: Specially matched colors in finished products; special compounds.
Representatives: Joseph F. Jehle, Fred F. Petersen, Robert R. Kobak.

Westinghouse Electric Corp.
Booths 312, 316, 322.

Wheelco Instruments Div. Bar-ber-Colman Co.
Booth 809. Exhibit: Automatic temperature control. Con-trollers and recorders plus control centers, as applied to applications in the plas-tics industry.

Representatives: R. A. Schoen-field, H. H. Kieckhefer, E. W. Heffernan, J. P. Canter, H. P. Berger, H. J. Hoffman, V. C. Piedmonte, H. F. Dahlke, H. King, G. C. Holbrook, H. Proske, B. H. Ramthun, C. L. Claeson, H. E. Shugars.

Edwin L. Wiegand Co.
Booth 646. Exhibit: Electric heating equipment used in the plastics industry, includ-ing vacuum forming, vinyl fusing, and other types of equipment.
Representatives: C. F. Kreiser, W. L. Thomson, Herman Smith, Werner S. Eyth, S. C. Campanella, George Sowash, Anderson-Bolds, Inc.

Witco Chemical Co.
Booth 736. Exhibit: Plasticizers, stabilizers, lubricants (stearates); thickening agents for plastisols and plastigels; fillers and reinforcing agents.
Representatives: Max Minnig, C. Silling, M. C. Vaughan, G. Hobach, H. C. White, E. F. Wagner, Yale Karmell.

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6th National S.P.I. Plastics Conference

The 6th National Plastics Exposition will be held in the Public Auditorium, Cleveland, Ohio, June 7-10. It will include displays by manufacturers of plastics materials and of machinery and equipment for processing and handling plastics, molders, laminators, extruders, and fabricators. Industrial and trade users of plastics are invited to attend the Exposition, which will *not* be open to the general public. Theme of the Exposition is: "Plastics Make Things Better for Everybody."

The annual Plastics Conference will be held concurrently with the Exposition. Sessions will be held at both the Hotel Cleveland and the Hotel Statler and outstanding authorities on plastics use will address each session. The Conference will be concerned with user interests and problems at the level of product applications of plastics. Special emphasis will be placed on electrical, refrigeration, automotive, and other industries employing large quantities of plastics.

Following is the planned program of speakers for each day of the Plastics Conference:

Monday, June 7 (Hotel Cleveland)

10:00 A. M.

Address of welcome—Hon. Thomas A. Burke, U. S. Senator, Ohio

Forum: Radio and Television Applications of Plastics

Speakers: "The Future of Thermosetting Plastics in Television Cabinets"—W. Goss, General Electric Co., Chemical Div. "Fully Automatic Molding of Radio and Television Components"—L. R. Wanner, Sylvania Electric Products, Inc., Parts Div.

"Design Trends in Radio and Television"—D. H. L. Jensen, Product Mgr., Philco Corp.

Movie: "Futures Unlimited"—Reinforced plastics applications and methods of production, by Zenith Plastics Co.

Tuesday, June 8 (Hotel Cleveland)

9:30 A. M. (two sessions to run concurrently)

(Session 1)

Forum: New Materials Session

Speakers: "Research and Standards for the Plastics Industry"—Dr. Gordon M. Kline, Chief of the Division of Organic and Fibrous Materials, National Bureau of Standards; Technical Editor, MODERN PLASTICS Magazine and Editorial Director, "Modern Plastics Encyclopedia and Engineer's Handbook"

"Expandable Polystyrene Beads—A Unique Plastic Material"—Edwin A. Edberg, Koppers Co., Inc.

"The Effect of Highly Intense Radiation Fields on the Synthesis and Physical Properties of High Polymers"—Dr. David S. Ballantine, Fission Products Utilization Project, Brookhaven National Laboratory.

Movie: "What's a Silicone"—Basic information on the composition properties, and applications of the various forms of silicones, by Dow Corning Corp.

(Session 2)

Forum: Plastics—New Materials in the Rubber Industry

Speakers: "Flexible Materials—Extrusion and Molding Developments"—Frank A. Martin, The Hoover Co.

"Plastisols—Processing and Applications"—Robert P. Molitor, Sun Rubber Co.

"Vinyl Sponge and Foam—Process and Applications"—George R. Sprague, The Sponge Rubber Products Co.

"Rigid Vinyls and Rubber-Resin Blends—Processes and Applications"—George Laaff, Bolta Corp.

6:30 P. M.

Reception and Banquet, Cleveland Auditorium

(Buffet dinner; Cleveland Pops Orchestra conducted by Andre Kostelanetz)

Wednesday, June 9 (Hotel Statler)

9:30 A. M.

Forum: Refrigeration and Air-Conditioning Applications of Plastics

Speakers: "Refrigeration and Air-Conditioning Applications of Plastics"—J. R. Hertzler, York Corp.

"Domestic Refrigeration Applications of Plastics"—R. E. Wallenbrock, International Harvester Co.

"Potentialities of Plastics for Refrigerator Linings and Large Area Parts"—E. T. Morton, Midwest Mfg. Co.

"Trends in Molding and Forming Sheets for Door Liners, Freezer Chests, Crispers, Drip Trays, Shelves, and Accessories"

Panel Discussion: Questions and answers

6:30 P. M.

International dinner (Hotel Statler)

Thursday, June 10 (Hotel Statler)

9:30 A. M.

Forum: Plastics Applications in Automobiles

Speakers: "Automotive Plastics Applications"—J. K. Totten, Ford Motor Co. "Cast Dies"—Robert H. Voss, Warren Plastics and Engineering, Inc.

"Reinforced Plastics Tooling"—Fred Lyijynen, Automotive Body Div., Chrysler Corp.

"Epoxy Plastic Dies, Die Models, Checking Fixtures, and Tooling"—George M. Rice, Ren-Ite Plastics Co., Inc.

"The Corvette Plastic Body"—John G. Coffin, Chevrolet Div., General Motors Corp.

List of Exhibitors begins on inside fold, with a floor plan of the exposition hall and condensed information on what each exhibitor will be showing and who will represent the company. List is up to date as of April 23.



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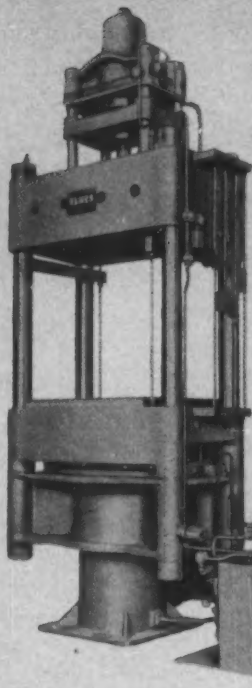
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KP-140
KP-201
KP-220
KP-411
Kronisol
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Kronitex K3
Kronitex MX
Methox
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Ohopex R-9
Tributyl
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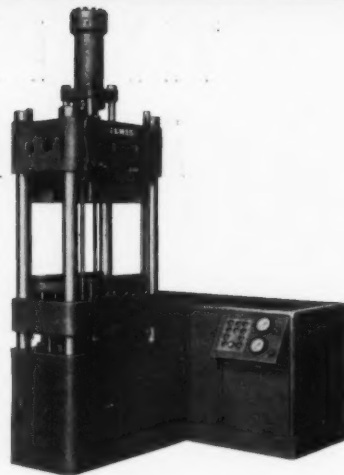
SEND FOR TECHNICAL DATA CONCERNING ABOVE PRODUCTS

It doesn't COST to own



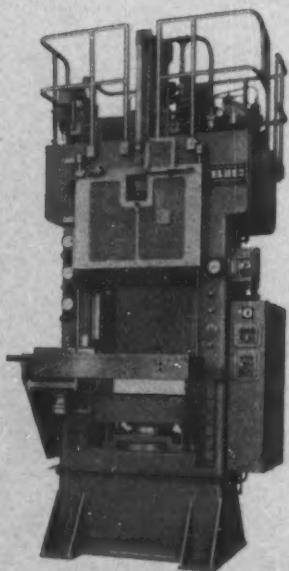
Elmes 500-ton Combination Transfer and Compression Press

Press changes from straight compression to transfer molding simply by flicking a switch. In the compression cycle, the circuit is arranged to provide two selective breathe periods. Opening during breathe can be controlled to suit each specific application. Curing cycle is set by motor-type timer. Pump is equipped with compensating control, so that during the curing cycle only the essential minimum horsepower is used.



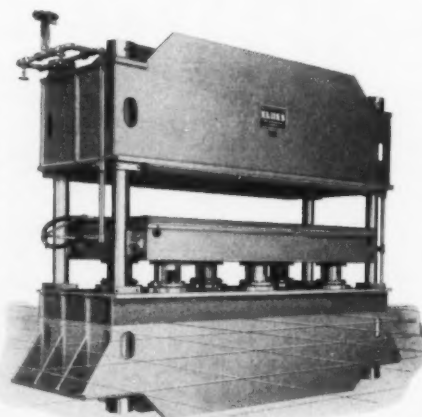
150-ton Semi-Automatic Molding Press

Press illustrated is typical of the Elmes full range of sizes for fast, accurate, economical production. Convenient pushbutton panel; pushbutton pneumatic reset of lower knockout; automatic position slow-down; extra large die space; many other features. Compression presses from 100 tons. No intensifier needed on transfer presses. A constant delivery pump holds pressure on main ram.



Custom-built Press for Low-Pressure Polyester Resins

This 450-ton Elmes Hot-Plate Press is equipped with six single-acting cylinders set into the press bed unrestrained. Rams bear against finished pads beneath the moving platen. Pushbutton controlled. Press system is arranged so that only the two center cylinders may be actuated if desired. Dual-pressure pump provides a high closing speed and moderate pressing speed.



Are Your Requirements Special?

There are times when a standard press won't do. An example is the Elmes custom-built 200-ton Transfer Molding Press shown above. If your requirements are special, and whether they call for a press newly designed throughout or just modification of an existing design, Elmes background, facilities, and foresight can save you many dollars and assure you press performance at its best.



We Cordially Invite You to Visit Us in Booth No. 705 at the NATIONAL PLASTICS EXPOSITION! (CLEVELAND . . . JUNE 7-10)

Here you'll find on display the latest, most advanced designs of Elmes Hydraulic Equipment for plastics molders . . . equipment of super efficiency, super economy. Be sure to drop in on us for a friendly chat and a leisurely "look-see"!

an **ELMES** molding press

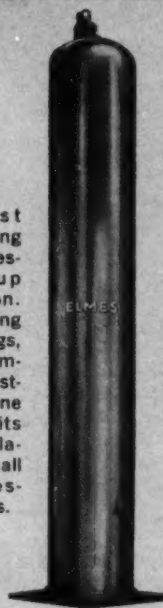
Elmes® plastics molding equipment, backed by over a solid century of engineering experience, is convenient and simple to use . . . fast, flexible, and economical to operate. An investment in Elmes hydraulic equipment pays big dividends in quality and speed of output. For all kinds of press applications you can count on Elmes for performance that turns cost figures into profit figures.

Elmes offers a complete line of *standard* equipment, including compression and transfer presses; Hydrolairs®—power presses requiring neither pumps nor motors; small-production, laminating, and laboratory presses; and Elmes pump-accumulator systems for group press operations. Or your requirements may call for *special* designs, in which case Elmes engineers can develop custom-built equipment to exactly suit your particular needs.

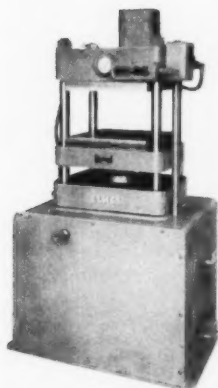
For detailed information on Elmes plastics molding equipment contact your Elmes distributor, or write to us direct.

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High-Pressure Pumps

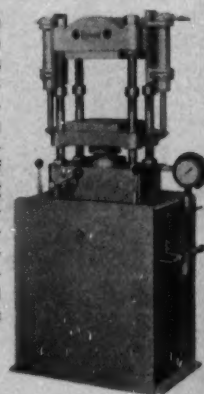
Motor-driven pumps—vertical from ½ to 100 h.p.—horizontal from 150 to 500 h.p. for pressures up to 50,000 p.s.i. Six-plunger horizontal pump shown has overlapping impulses for smooth flow. Exceptional features, many patented, make it the master of any pressure situation. Also available in hand-operated types.



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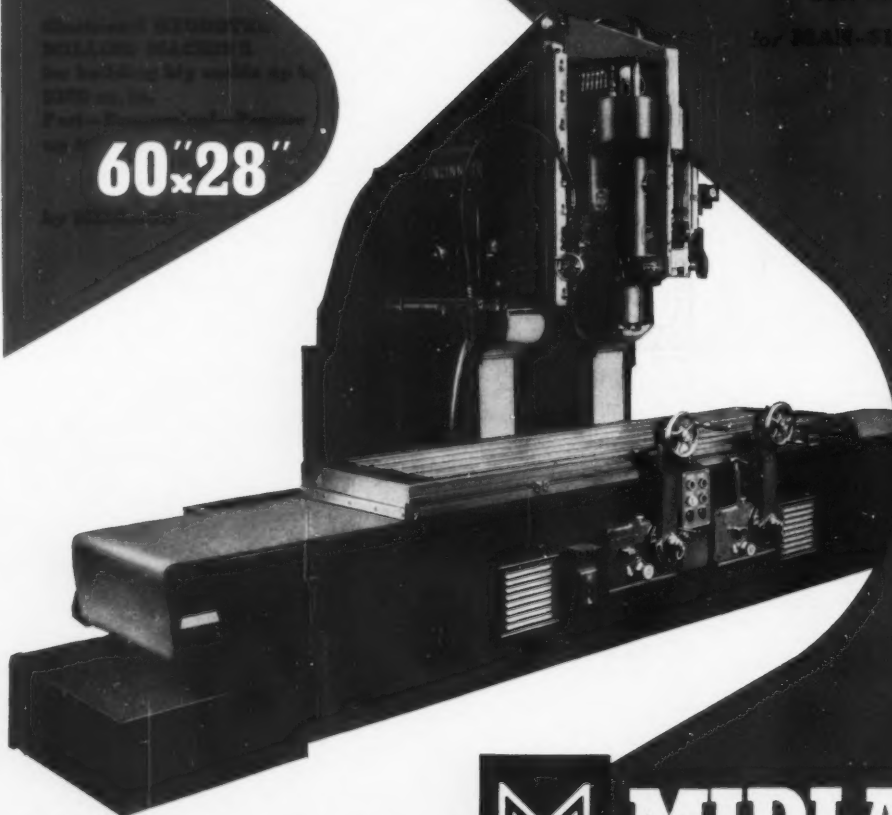
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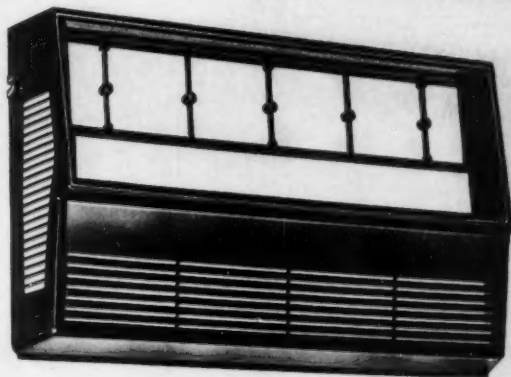
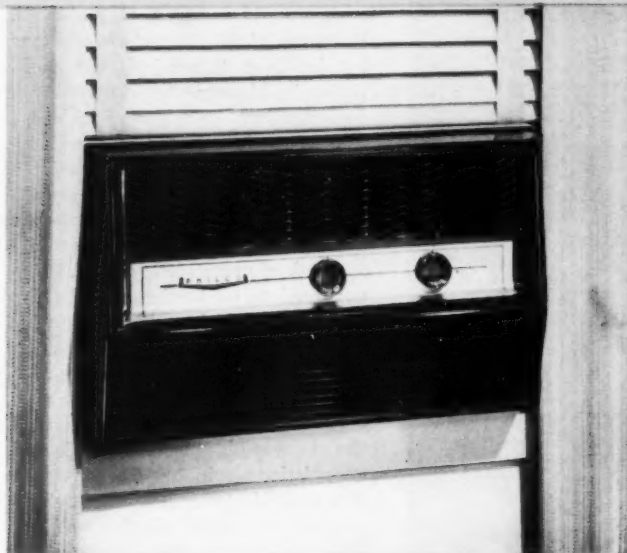
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PLASTICS ENGINEERING*

F. B. Stanley, Engineering Editor



Courtesy Philco Corp.

Decorative one-piece cabinet front (right) of $\frac{3}{4}$ -hp. home air conditioning unit (left) is produced in a single-cavity injection mold. The many louver openings in the front are molded flash-free because of accurate mating of the mold components

Solving Big Mold Problems

AS MOLDED plastics items became larger and larger, mold makers were faced with a number of new problems. Many found they needed larger machine tools and equipment for handling and machining the heavy forgings which had to be made into cavities and force plugs for such items as refrigerator inner door liners, large radio and television cabinets, grilles and cabinets for large air conditioners, and many other "out-size" plastic products.

Another unhappy discovery was that large steel forgings sometimes warp and develop cracks after heat treating. Because more than 90% of the tool maker's work is completed before heat treatment and because such flaws usually can not be repaired, building large molds can be quite a gamble. Sometimes the defects will not show up in mold parts until the first few shots have been made. Such a situation always causes heated discussions between the mold maker and the molder as to just

How a large part of the gamble has been removed

from the production of large molds by Islyn Thomas†

who is responsible for the damage. In addition to the monetary loss, the molder's customer is faced with a long delay in getting molded parts, which probably causes more headaches than all of the other troubles added together.

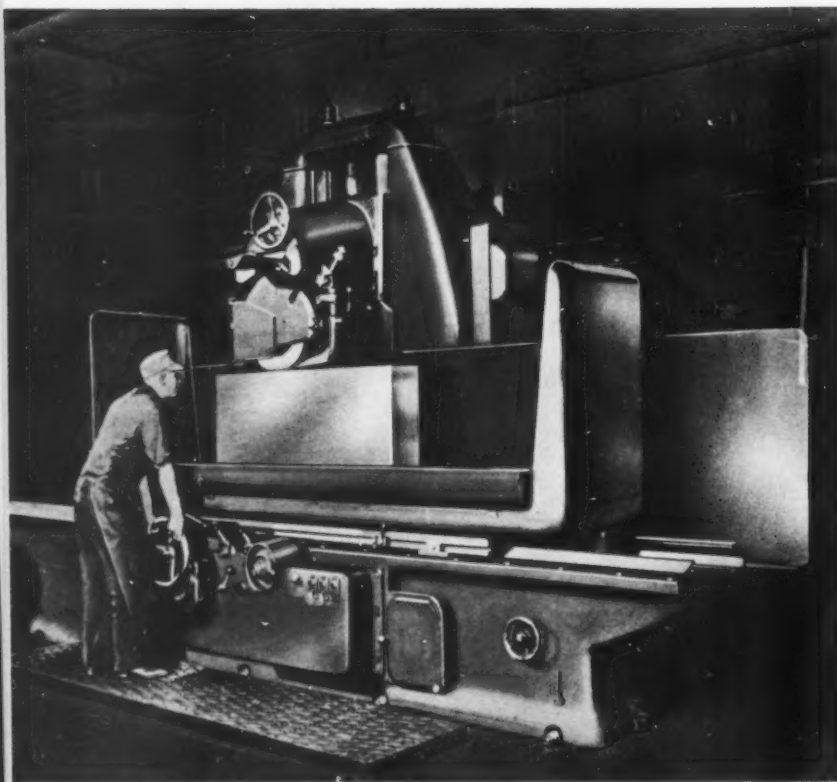
While most mold makers have kept abreast of the times by installing machine tool equipment for handling extra large forgings, it was not until a short time ago that at least one large supplier of forgings, Latrobe Steel Co., developed a steel which is not too hard to machine, but still is hard enough to withstand the high pressures used in molding. Also it will take a high polish after machining. Forgings of this new material, which is known as Cascade and is a precipitation-hardened, low-carbon, aluminum-nickel tool steel, Rockwell from 34 to 36 on the C scale.

One of the first molds made from this new steel was a single-cavity injection mold for a large grille measuring 26 in. long, 15½ in. wide, and 4¾ in. deep, with an average wall section of 0.100 inch. This grille was to be used as the face panel for a newly designed Philco air conditioner to be manufactured by The York Corp. Because of the many vent openings, bosses, and molded-in holes, this mold had to be built to very exacting tolerances to be sure that no labor would be needed for removing flash either from the parting line or the molded-through vent openings.

No Flash

The molder, Bridgeport Moulded Products, Inc., placed the order for the mold with Newark Die Co., the specifications stating that no flash-

* Reg. U. S. Pat. Off.
† General Manager, Newark Die Co.



Courtesy Latrobe Steel Co.

Red-hot billet of special pre-hardened steel is being vigorously worked in steam forging hammer. This operation refines structure of steel to a very high degree



Courtesy Newark Die Co.

First operation in tool maker's plant is the squaring up of the rough forging, preparatory to start of machining. A huge surface grinder is used for this step

ing could be tolerated. Not too long before this order was placed, Newark Die might not have accepted such a stipulation without increasing their price to cover possible added costs due to warping of the mold. However, at the time of negotiations for building this mold, the mold maker had become familiar with the new pre-hardened steel which did not require heat treatment after machining and which would eliminate problems of warping and cracking.

But this was not the entire answer for the job in hand. Since the strength of any steel is roughly proportional to its hardness, and since this mold would be subjected to very high pressures during injection (1500 to 1600 p.s.i. on the injection ram), it was necessary that the steel used be hard enough to withstand the stresses placed on it, yet be soft enough for machining. For example, if the yield strength of the steel is too low, the mold will flex and deform under load, thus causing the same flashing problem which exists when a mold warps during heat treatment. Another important factor is the requirement for a sufficiently high strength to resist denting or sinking of the cavity. The problem with this grille mold was primarily one of denting or peening from flash between the cavity and force.

High Strength Needed

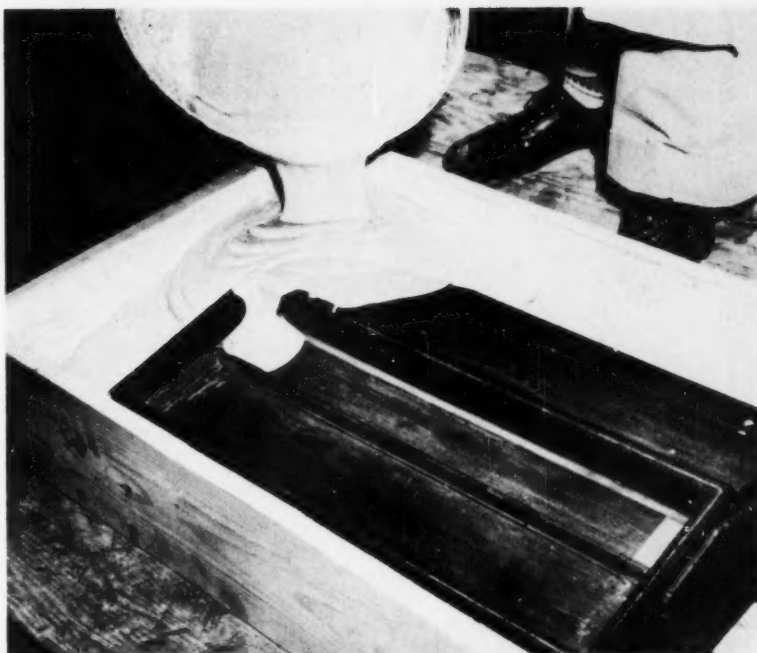
The compressive stresses encountered under such conditions cannot be calculated with any degree of accuracy, but they are known to reach extremely high values especially when a fast injection speed is used. The latest theory (now proved by experience) is that large-area parts are molded better when the material is injected into the mold in as short a time as possible. The fact that this mold was going to be run in one of the latest design H-P-M 200-oz. machines, which have a very high injection speed (on the order of 200 oz. in three sec.), was just another reason why the mold steel used had to have a very high strength. Since Cascade has a form yield strength of 164,500 p.s.i. Newark Die had no misgivings about building this mold and guaranteeing "no flashing."

First step in preparing the forgings for this job was to melt the aluminum-nickel tool steel in a small electric arc furnace using the

highest possible standards of quality control for tool steel to assure cleanliness and uniformity of the mold blanks. The cast ingots were vigorously worked in one of Latrobe's steam forging hammers to refine the structure of the steel to the highest possible degree. The forgings thus produced were then annealed, solution-treated, and age-hardened. The final step produced a hardness of Rockwell C 34 to 36 throughout the entire mass. Before delivery, however, both forgings were reflector-scoped to check for any internal segregations, inclusions, or other defects.

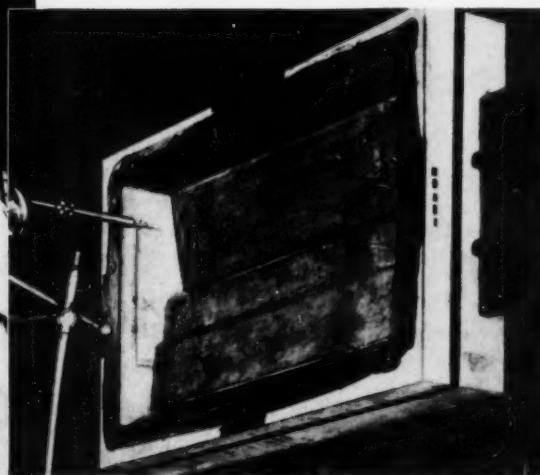
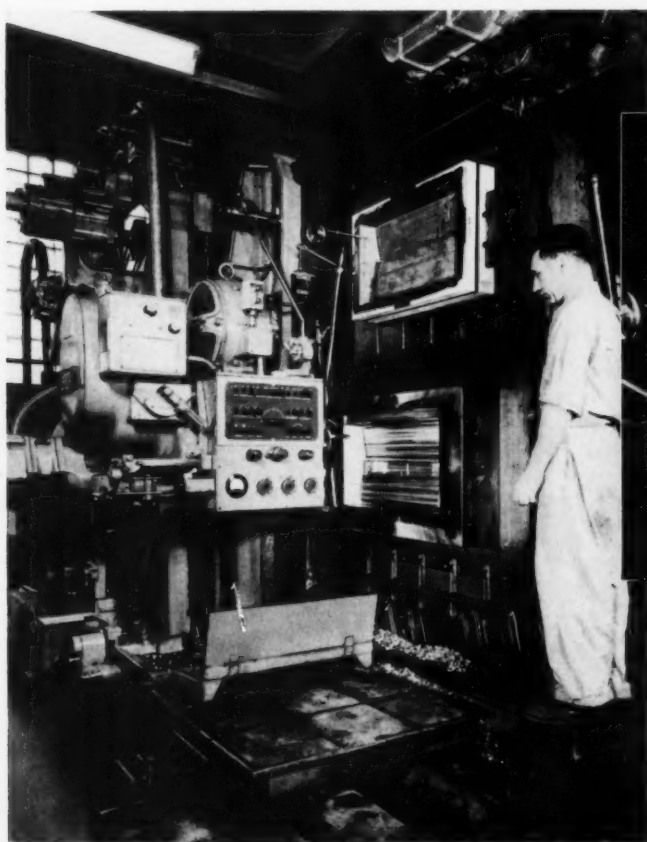
During the time the forgings were being prepared, an expert pattern maker was producing an accurate wooden facsimile of the part to be molded. This male pattern was made somewhat larger than the required plastic part by an amount equal to the known shrinkage of the Dow 475 material of which the grille was to be molded.

The male wooden pattern was then given several coats of wax and



Courtesy Newark Die Co.

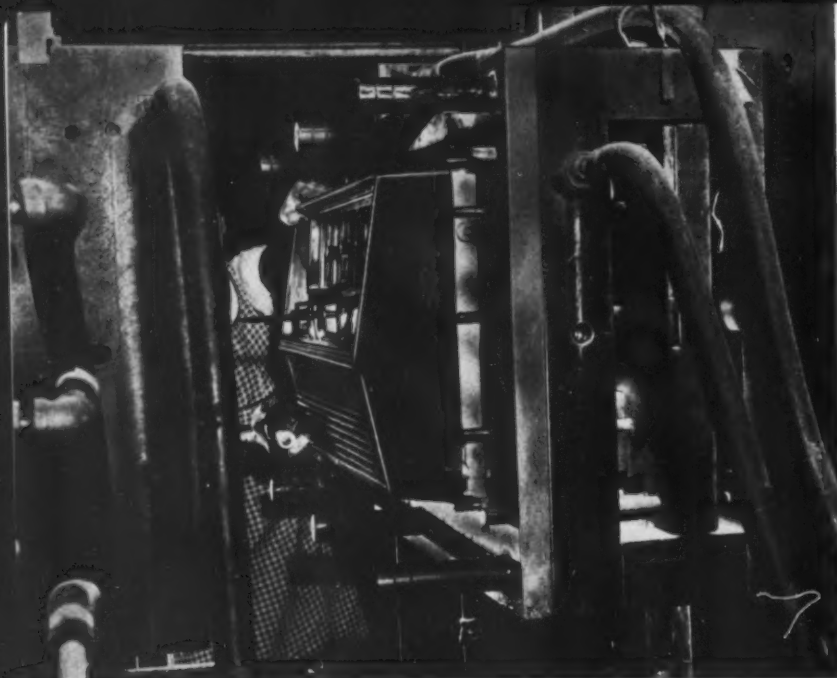
Special stone mixture is being poured on wooden facsimile to make master pattern for die sinking of mold cavity. Casting must set for about 12 hr. to reach required strength



Courtesy Newark Die Co.

Close-up view of stone pattern, showing automatic tracer which guides the cutter of the die sinker

Over-all view of Keller die-sinking equipment in operation. Stone pattern and automatic tracing apparatus is at top, partially machined cavity is below



Operator is about to remove large air conditioner grille from force plug of single-cavity mold. Knock-out pins have pushed molded part nearly off force plug to facilitate its removal. Shot weighs over 30 oz., has projected area of about 403 sq. inches

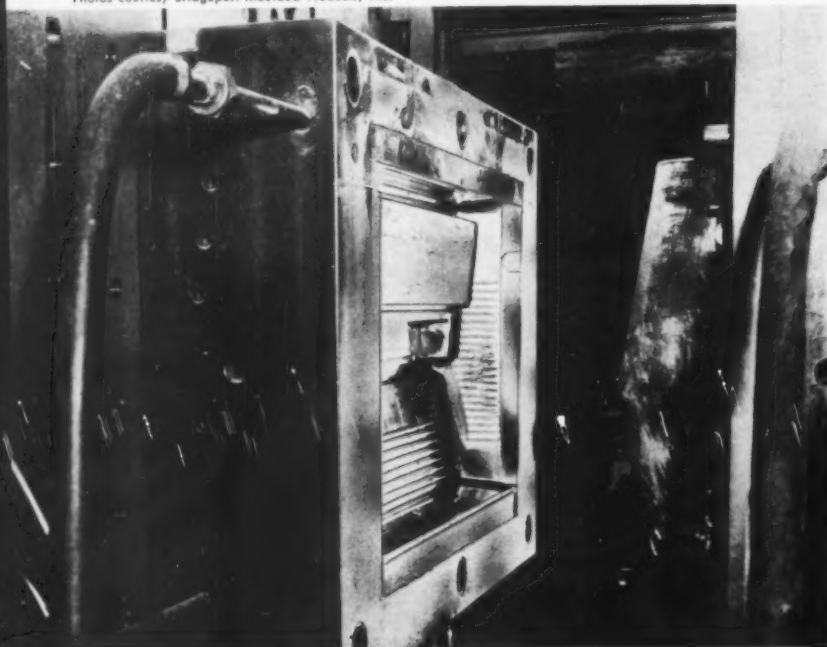
the surface polished to a high luster in preparation for producing a cast female pattern. The finished wooden model was then placed in the center of a rectangular wooden form prior to pouring in a special stone mixture called Tamastone, made by Tamms Industries, Inc., Chicago, Ill.

This stone, in powder form, was first mixed with water to the approximate consistency of molasses. After the form had been completely covered with sufficient material to provide the required strength, it was permitted to set for about 12 hours.

The cast was then carefully re-

Close-up of cavity half of grille mold shows intricate design. Each section of cavity must mate accurately with force plug to insure perfect, flash-free cut off

Photos courtesy Bridgeport Moulded Products, Inc.



moved from the male pattern and the sides and bottom squared up. This casting was then used as the master pattern for the die sinking of the mold cavity while the original wooden model was used as the pattern for the force plug.

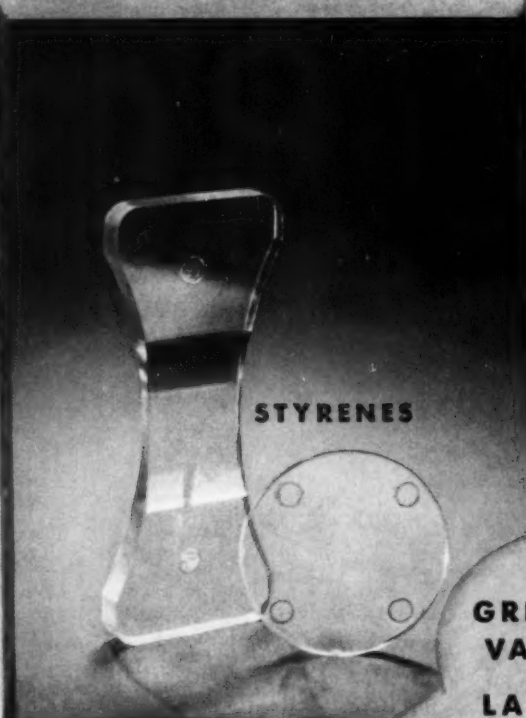
Before beginning the die sinking operations on the forged mold blanks, they were squared up in a huge Mattison surface grinder. Next, the holes for water lines and guide pins and bushings were drilled. After these preliminary operations had been completed, both the mold blank and the stone pattern were set up in a large Keller machine to produce the cavity. Although the material shrinkage had been taken into account in the preparation of the wooden pattern which was used to machine the force plug, it was necessary to properly adjust the relative positions of the tracer and cutting tool on the Keller to make provision for the wall thickness of the molded part.

It is generally thought that machinability is pretty much a matter of material hardness; that is, the harder the steel, the harder it is to machine. This is true to some extent, but other factors enter the picture so that machinability problems cannot be anticipated entirely on the basis of hardness. This fact is borne out by Newark Die's experience in machining prehardened steel. Even though it Rockwelled 34 to 36 on the C scale, the mold maker states that it was necessary only to reduce the speed of the cutters and feed slightly in order to produce a good cut.

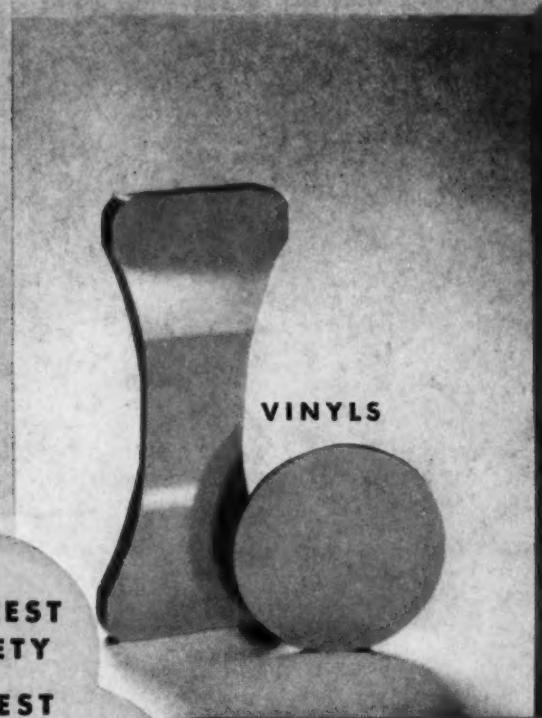
After the practically automatic Keller operation of machining the details on both the force plug and cavity had been completed, the next step was fitting or spotting. For this work, the mold was mounted in a large hydraulic spotting press having a platen area of 42 by 76 in. and a 36-in. stroke. The parting surface of the cavity was first coated with prussian blue and the mold closed. Upon opening the mold, the high spots on the parting line of the force plug could be readily seen and cut down. This spotting operation was continued until all high spots had been removed and a perfect match of the parting lines obtained.

The next step was checking the accuracy of the wall thickness of the part which this mold would produce

(To page 197)



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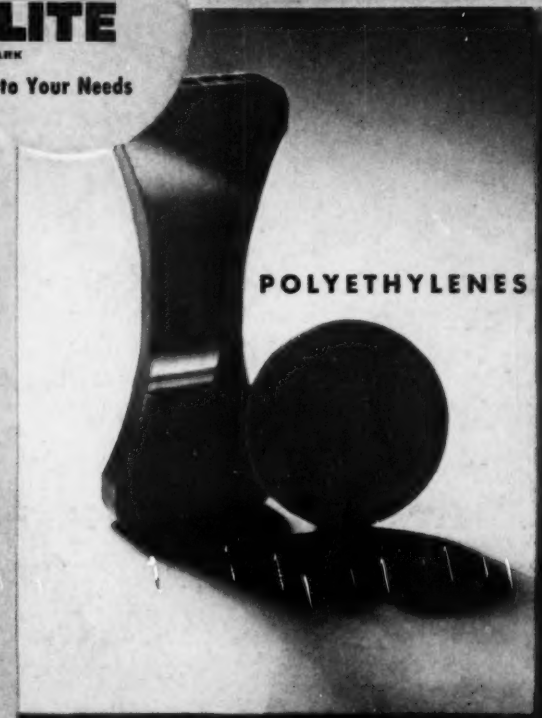
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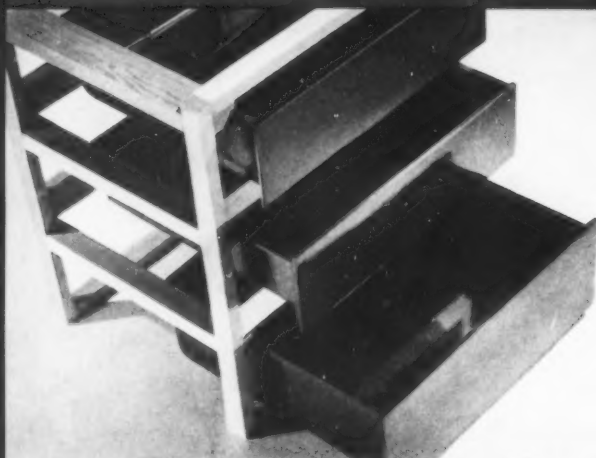
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PHENOLIC PLASTICS



Drawers molded of BAKELITE Phenolic Plastic by Boonton Molding Co., Boonton, N. J. and Richardson Company, Melrose Park, Ill.

These one-piece furniture drawers typify the many advantages of molding with BAKELITE General-Purpose Phenolic Plastics. They have no joints or seams. Surfaces are smooth and glossy. Color, a rich black. Runners and center guide flanges are molded in. Corners and edges are rounded so dirt won't collect.

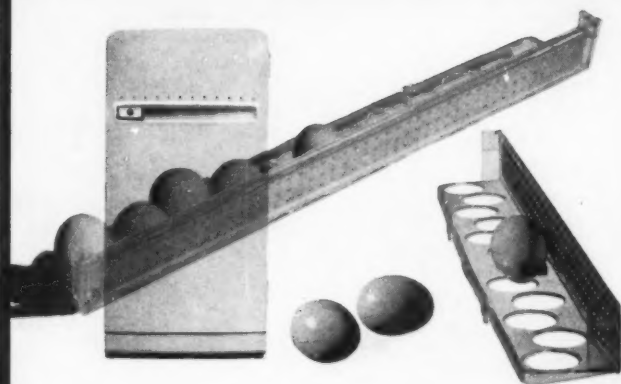
Their BAKELITE Phenolic Plastic construction means they won't warp, crack, or dry out. They need no applied finish. Their hard surface prevents sticking, resists dents and scratches. A damp cloth cleans them.

At present, the drawers are molded in three sizes: 18 in. wide by 15 $\frac{3}{4}$ in. deep by 6 in. high, . . . 17 $\frac{1}{8}$ in. by 14 in. by 4 $\frac{3}{4}$ in. . . and 16 $\frac{3}{4}$ in. by 14 in. by 4 $\frac{3}{4}$ in.

Other large-scale moldings such as television cabinets, air conditioner housings, and portable refrigerator cases are being successfully mass-produced from BAKELITE Phenolics. Write Dept. XJ-13 for technical data on these molding materials.

BAKELITE

STYRENE PLASTICS



Egg tray for Westinghouse Electric Corporation refrigerator molded of BAKELITE Styrene Plastic by Amos Molded Plastics Co., Edinburg, Ind.

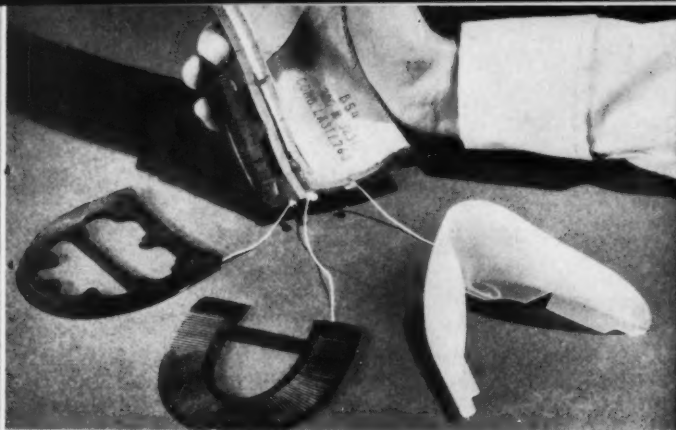
A refrigerator egg tray becomes a striking design feature when it's molded of BAKELITE Styrene Plastic. Its smooth surface gleams. Its details are clean and sharp. Its precise dimensions speed assembly operations.

Crystal-clarity is an inherent property of pieces molded from BAKELITE Styrene Plastics. Here, the reverse side of the tray was painted to heighten the decorative pattern.

A recent development in BAKELITE Styrene Plastics are the SMD-3500 grades. They are formulated for molding with lower pressures and temperatures than earlier types. They can be molded faster and on lighter machines at lower pressures. SMD-3500 materials are available in a range of transparent colors and clear, as well as translucent and opaque.

Information on the new improved BAKELITE Styrene Plastics can be obtained by writing Dept. XJ-13.

BAKELITE COMPANY, A Division of Union Carbide and Carbon Corporation 
30 East 42nd Street, New York 17, N.Y.



Shoe parts molded of BAKELITE Polyethylene by Albert H. Weinbrenner Co., Milwaukee, Wis.



Insulators for battery test clips molded of BAKELITE Vinyl Elastomeric Plastics by Mueller Electric Company, Cleveland, Ohio.

BAKELITE POLYETHYLENE PLASTICS

Shoe counters, heel bases, and "dutchmen" of BAKELITE Polyethylene are important components of Weinbrenner's Bondshire dress shoes and Thorogood "Job-Fitted" work shoes. These shoe parts take full advantage of the material's toughness. Polyethylene won't crack or lose shape. It keeps its flexibility over long periods, resisting water, acids, and rot.

Easily molded and extruded, BAKELITE Polyethylene reproduces fine mold details. A groove molded around the edge of the heel base speeds stitching operations by acting as a guide. The heels are molded on a 22-second molding cycle with a 16-cavity mold that produces three basic sizes.

The variety of properties offered by BAKELITE Polyethylene make it suitable for a growing array of applications that benefit from its unparalleled combination of mechanical and electrical properties. Write Dept. XJ-13 for booklet "BAKELITE Polyethylene," describing uses ranging from high-frequency electronic service to squeeze bottle packaging.

Choosing the right material is the starting point for making your product a success. Bakelite Company helps with this problem by giving you a choice of the four molding materials in greatest general use today, along with other types that are growing in importance. You pick from a wide range of materials, and an even wider range of properties.

BAKELITE VINYL PLASTICS

Insulators for battery test clips have to withstand abrasion, constant handling, oil and grease, moisture, and contact with acids in everyday use.

Made from BAKELITE Vinyl Elastomeric Plastics, they stay flexible, resist cracking and drying. Tensile and flexural strengths are long-lived. Their various colors—red, yellow, blue, black, and white—keep fresh, simplify identification in complex circuits.

BAKELITE Vinyl Elastomeric Plastics can be molded or extruded, with a semi-gloss or high-gloss finish. Their flexibility can also be controlled, to range from highly flexible to semi-rigid. The flexible materials permit easy removal from the mold even where deep undercuts are formed. Intricate shapes can be produced at relatively low cost. Details may be extremely fine—these insulators have the manufacturer's name clearly printed in three dimensions around their wide edge.

Experienced Bakelite Company technical representatives, located in the major industrial centers, are at your service. These sales engineers are backed by the industry's most extensive research and development facilities, and 44 years of Bakelite Company leadership in this field. You can get full consideration of your problem by writing Dept. XJ-13.

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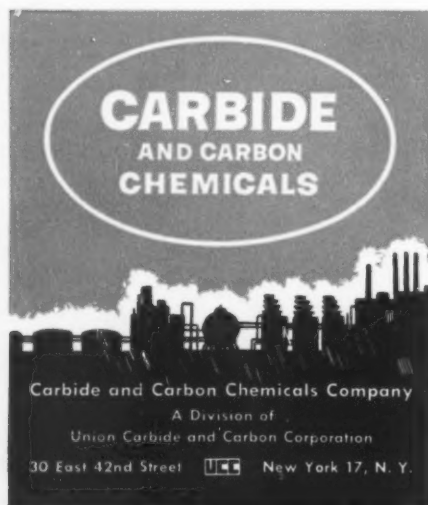
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Vinyl resin floor tile, plasticized with FLEXOL DOP stands up under daily use in playrooms, libraries, kitchens, and retail stores.

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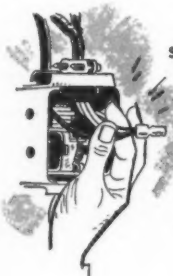
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when set up in operation. Very soft lead strips were placed in the mold cavity and the force plug carefully closed on them. After sufficient pressure had been applied on the halves so that the mold closed completely, it was again opened and the thickness of the compressed soldered strips carefully checked. Naturally, the thickness of the strips will be the thickness of the part when molded. After it had been ascertained that the mold would produce a part to the required dimensions, the next step was to produce a very high luster on the molding surfaces.

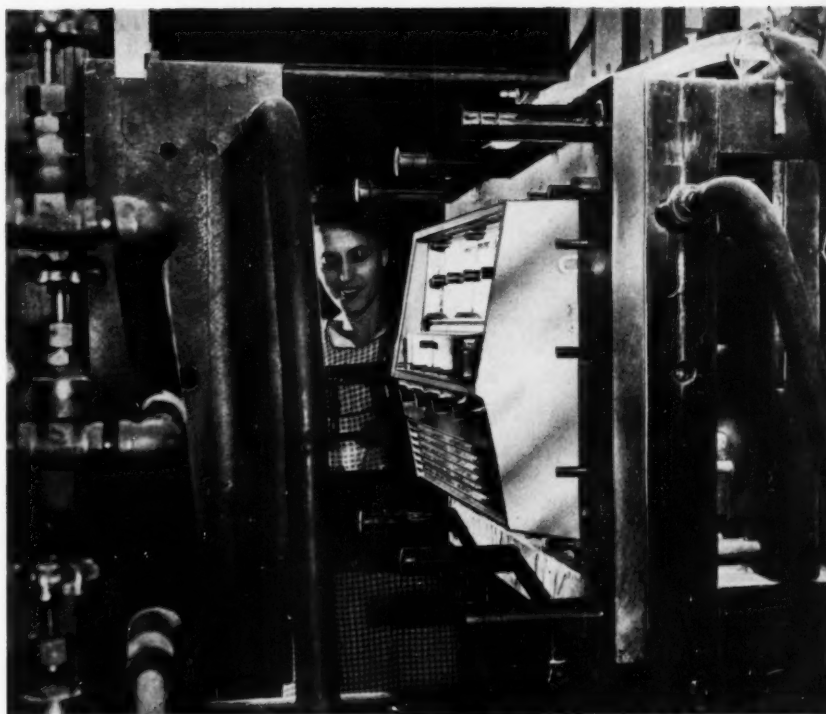
Mold Polishing

It is generally agreed among those skilled in polishing molds that the harder the steel the higher the luster obtainable, although at the higher hardness levels the problem of metal removal is more difficult and the polishing operation takes longer to complete. Other factors than hardness, however, enter the picture in polishing, such as the uniformity of the steel itself. If the micro-structure of the steel contains aggregates of soft particles and hard particles side-by-side, a high finish with absence of orange peel effects and pitting becomes more difficult to obtain.

Because no heat treatment after machining is required with this special mold steel, and, therefore, no carbon was added to the surface of the steel, there were no hard carbides in the steel structure to cause non-uniform polishing conditions. The final polishing of the mold to eliminate the marks of milling or riffle filing was done by hand, using silicone-carbide abrasive stones.

After the original machining marks were removed, a finer stone was used with a motion 90° to the prior one until these stoning scratches were erased. This process was repeated with finer and finer grit stones until the desired finish was achieved. The final high gloss was produced by buffing with special polishing compounds on buffing wheels which were operated from flexible shafts.

The next step, after the mold had been set up in the injection machine at Bridgeport, was to run samples, check their dimensions, and submit them to York for their approval. As soon as molded pieces were available, a special fixture was built for



Photos courtesy Bridgeport Moulded Products, Inc.
Large number and size of knock-out pins insure perfect ejection of molded part

cutting all the multiple gates cleanly and at one time.

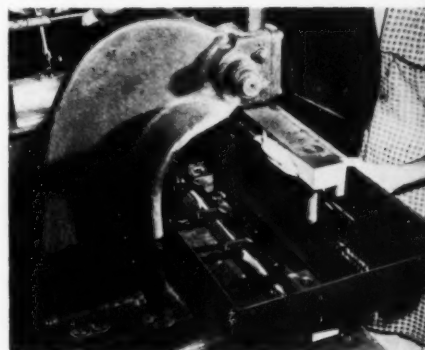
Limited production was begun in order to "work-in" the mold and determine optimum cycle times, pressures, and temperatures. It was found that the fastest injection speed available in this machine could not be used since it caused weld marks in the ribs of the grille work. Speed of injection was finally worked out so that the total weight of the shot (35¼ oz.) was delivered into the mold in slightly under 4 sec. with injection pressure of 150 to 160 tons.

Operating Temperatures

The following temperatures for the molding machine were found to be the best for running the Dow 475 material. The first and second zones on the preplasticizer were set at 440 and 460° F., the first and second zones on the holding chamber at 460 and 420° F., while the three zones on the injection cylinder were held at 420, 400, and 400° F. respectively. The nozzle temperature was 350° F.

A Sterling mold temperature control unit was used to hold the force plug at 120 and the cavity at 130° F.

When all these variables had been set and finalized it was found that



Special die mounted in arbor press cuts off all gates simultaneously

only 66-sec. over-all cycle time was required to run these grilles. The finishing operation—cutting the gates—is performed by the press operator. Since this job started, over 80,000 pieces have been produced with no evidence of mold or other troubles.

This is a fine example of cooperation between the steel manufacturer, the mold maker, and the molder which resulted in perfect, high-speed production of another large plastic part.

A New Look at Extrusion

by Herbert O. Corbett†

Heater systems and machine drives are examined and a new concept of inexpensive, interchangeable die base design is explained in detail

IN THE operation of a large extrusion plant, say eight or more extrusion machines running 24 hr. a day and extruding both cellulose and vinyls into virtually any shape, the engineer is required to have specialized knowledge, very little of which can be obtained through formal schooling. Even available theories are as varied as the individuals expounding them. The following unbiased discussion of the major components of oil and electrically heated extruders by an engineer currently working with both should therefore be of value to the industry. In addition, I will attempt to explain how, as proved by my own experience, the design of an extrusion die can be made a science instead of an art.

Heater Problems

Which is better—an oil or an electrically heated extrusion machine? Seldom can this question be asked in the presence of other successful extrusion engineers without starting an argument which seldom concludes in any other way than each engineer favoring the particular type of equipment he has to work with. In my opinion, there is no appreciable difference for run-of-the-mill operations.

Both types are used at Auburn and both perform with equal versatility. Electrically heated extruders usually require less floor space and are by nature cleaner. Old timers will claim that no other method can be more uniform than the transfer of heat through oil. Heat can be reduced more rapidly if need be and ambient or frictional heat build-up can be controlled better; yet modern electric machines have blowers for the same purpose and they work.

Electrically heated extruders are

a necessity when the extrusion temperature of a particular material exceeds the flash point of the transfer oil. They are just as easy to keep in top notch operating order and are much less difficult to troubleshoot and repair if difficulty should be experienced with the heating systems.

Upon recommending the purchase of a particular type machine, the engineer must naturally justify its cost. When bought from the original equipment manufacturer, neither heater design has much to offer as a decisive cost advantage. This, then, brings up the question of machine drive—next costly, and sometimes most costly, part of the purchase. At this point the argumentative engineers seem to have more in common, actual cost versus trouble-free performance being the main topic for conversation.

The direct-current variable-speed drive is generally considered best for all around flexibility, particularly in a job shop or custom shape extrusion type of business. Where a single type of extruded product is made—such as large sheeting, film, pipe, etc.—it is generally conceded that a less flexible drive is most satisfactory. Any advantage a variable-speed drive may have is hardly noticed for this latter type of extrusion.

A real saving is apparent whenever it is possible to drive an extruder with nothing other than a motor and a four- or six-stage gear box. Such drives are very dependable and usually are more trouble-free than any other kind.

Interchangeable Parts

This brings up the matter of interchangeability of machine components. Despite inherent advantages, few companies carry spare parts of sufficient range to consider all machines to be immediately serviceable

from stock. All users of extruders carry spare rectifying tubes, brushes, contacts, oil pumps, and spare oil immersion heaters, but who stocks a spare 40-hp. drive or a complete spare oil heating unit? We all depend primarily upon prompt factory service for the extruder and its accessories.

Basic Tooling Design

Research to obtain good basic design in tooling an extruder for production can be considered to be the most important phase in the operation of a successful plastics extrusion plant.

Any modern extrusion machine will do a good production job if it is properly maintained. However, lack of interchangeability in die design, for example, will hamper delivery and will seriously affect production scheduling. Such a lack, if coupled with complexity, frequently results in the extrusion engineer having to do much of the work on the tooling himself. Filing, grinding, and otherwise altering the shape of the orifice and the rear approach passages may ultimately result—after time consuming and costly labor—in the desired section being obtained. But nothing is learned through such operations and similar work has to be done all over again on the next

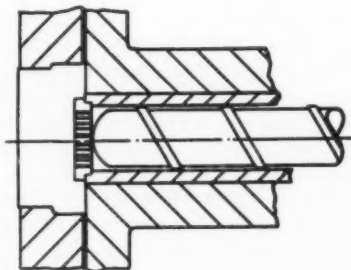


Fig. 1—Basic die blank in position at end of extruder barrel, with breaker plate in place

* Adapted from a paper presented at the 10th Annual Conference of the S.P.E., held in Toronto, Canada.

† Chief Engineer, Extrusion and Sheet Forming Divs., Auburn Button Works Inc., Auburn, N. Y.

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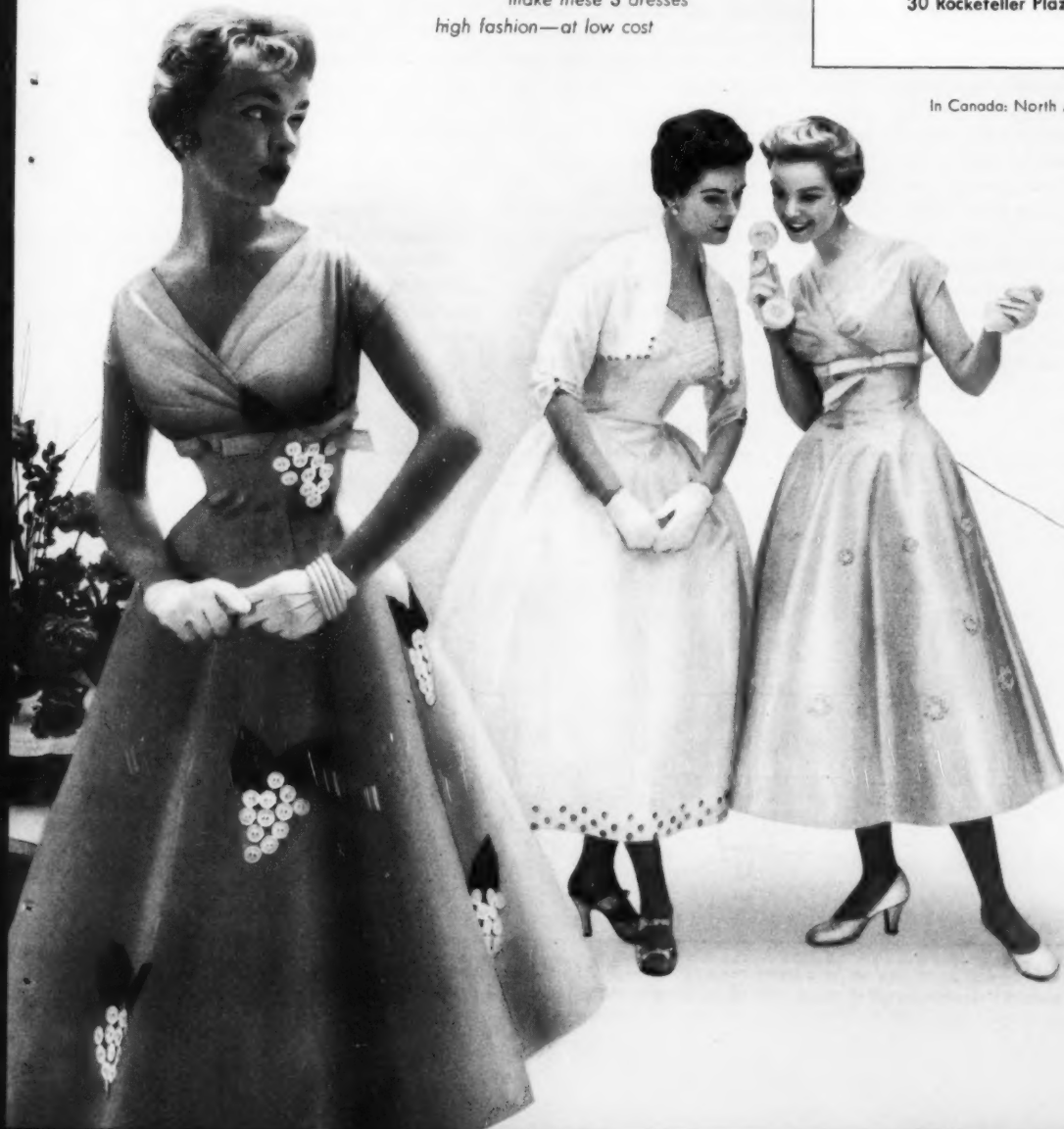


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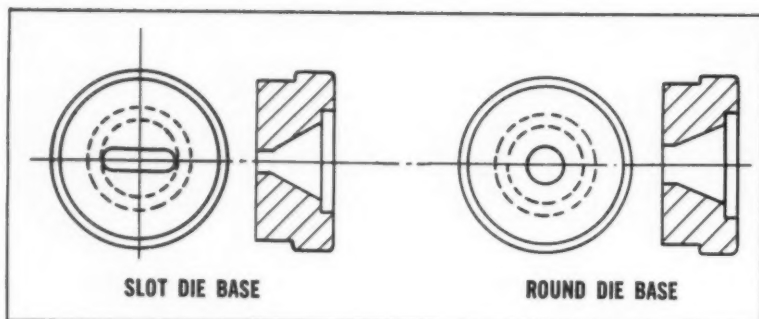


Fig. 2—With only about three variations in dimension for the hole and slot, these two die bases will be satisfactory for many different extruded shapes

job. In addition, if a die on which much labor has been expended is misplaced between customers' orders, there is nothing else to do but to start once more from scratch.

If, however, the aforementioned research on good basic tooling design is carried out, the over-all extrusion operation will become much more efficient. Such research should begin at the breaker plate. Most extrusion machines come equipped with a so called "swing gate." This is good. Leave it alone, except that: 1) it should be heated; 2) hinge pin should be a loose fit; and 3) it should swing free and be maintained so it will line up easily.

Here could begin controversy in design. However, instead of discussing all of the various alternatives comprising good design, a good basic system will be shown which really

works and which may or may not concur with your own systems.

Illustrated in Fig. 1 is a schematic section of an extruder barrel with the swing gate closed, showing a basic die blank, or die base as we shall call it, securely locked in position and in turn clamping the breaker plate against its shoulder, thereby preventing any leakage. Incidentally, if a breaker plate should bottom out on the screen pack, excessive leakage could occur, which might give the impression that the gate is sprung or the die base is not seating properly. This head design is most common and is standard as supplied by many machine makers.

Streamlining Not Necessary

Now, how should each particular custom shape be approached? Should a design be absolutely

streamlined from this point to the orifice? The answer is no. Of course, there should be no back eddys or trapping corners, but real economy and inexpensive design is dependent upon not having to have fluid-like flowing compound curvatures to the orifice. The consideration simply involves the basic shape or shapes which will satisfy most extruded sections.

In Fig. 2 are illustrated two die bases with two approaching passages, identical except that one ends as a circle and the other as an elongated slot. With only about three changes in the dimensions of the hole and the slot, we have here a completely interchangeable permanent type of die base.

The big features of the approach shape shown in Fig. 2 are its low cost and the fact that it can be made in its entirety in any conventionally equipped machine shop.

Adapter rings (Fig. 3) make it possible for the interchangeable die bases to be designed to accommodate the maximum capacity of each particular size of extrusion machine, yet also to be adaptable to any size larger machine. Thus, a standard 2½-in. die base with an adapter ring will fit a 3½-in. machine; a 3½-in. die base with an adapter ring will fit a 4½-in. machine; and the 2½-in. die base will fit directly into a 4½-in. machine by using two adapter rings.

With such rings, it is possible to

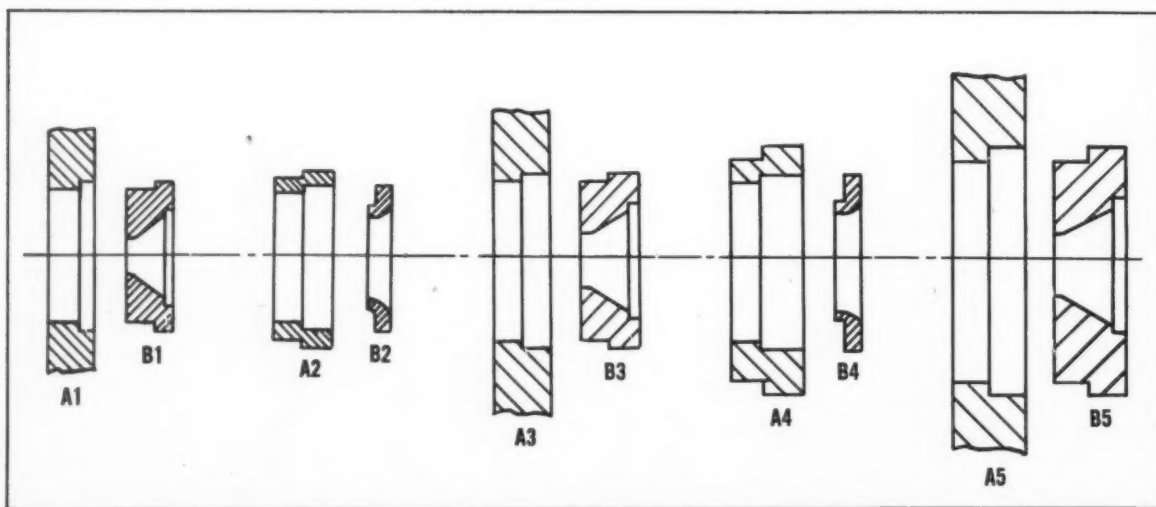


Fig. 3—Design of this set of adapter rings (A1 through A5) and die bases (B1 through B5) permits interchangeability of the die bases on 2½-, 3½-, or 4½-in. extrusion machines

operate any set of tools in any machine, which enables selectivity for most efficient operation as well as for emergency scheduling.

Plate Die

The actual orifice to be used with the die bases described is made from common flat ground stock and hence may be called a plate die. It is mounted in the manner shown in Fig. 4. The orifice shown in that drawing is for the extrusion of tape.

The die base is first drilled and tapped with a set of holes standardized for all 2½-in. die bases of this type. Since previous experience indicates that tapes run well either on a 2½- or a 3½-in. machine, it was decided to make up a standard 2½-in. split type plate die. There is nothing else to consider because the complete tooling can fit into either machine.

For the die base-approach combination the narrowest slot-type of standard die base was selected, the width of the slot being, say, ½ inch. It might be pointed out, and correctly, that this arrangement isn't streamlined; that the approach is into a dead wall against the die plate. This fact brings up another point in the extrusion of thermoplastics. Any die orifice machined to say 20% greater dimensions than the desired finished section size, with uniformity of section—that is, the same wall thickness throughout—should result in a perfect extrusion on the first trial, if approached in this manner. Contrary to the general belief, burning of material will not be experienced if the above approaching method is not ridiculously over-emphasized.

In my opinion, it is imperative that a die should not be designed as one big venturi. A venturi is a restricting orifice so designed as to increase the rate of fluid flow, thereby proportionately reducing the pressure of the same fluid at the points of restriction. Dies designed in this manner generally "pitch curves," resulting in extrusion conditions which are almost impossible to diagnose. It is virtually impossible to balance the flow from a dual orifice under these conditions.

When the thermoplastic compound is plasticized and becomes a semi-fluid mixture, it behaves in the same manner as any other fluid passing through a venturi-like shape. Being

fluid, it wants to remain together as a mass. However, when the road down which it is traveling becomes longer for part of this mass than it does for an adjacent part, the velocity of that part of the fluid with the greater distance to go must increase. Should this hypothetical venturi be the extrusion die orifice, the increase in fluid velocity becomes apparent outside the die, just where it contributes to shape distortion or produces an unmanageable glob of material.

It is worth noting here that the die land length can greatly alter this explanation. It is well understood that a longer land, particularly where a thicker section of an extruded shape is passing through the die orifice, will help retard, due to the extra surface friction, what otherwise might be a very heavy flow at this point. It is my contention that it is easier and far more economical to correct desired shape errors by enlarging or decreasing the actual die orifice opening and not by altering the die land length which is principally accomplished by altering the rear approach paths.

Many extrusion engineers of long experience take pride in saying that they have made many dies and have yet to make one start right off directly out of the machine shop. If a desired section shape cannot be obtained without several trials, there is something wrong with the set-up.

As previously stated, burning will not be experienced if the die orifice is approached slightly oversize and straight away. It takes just a little mental exertion to see the possibilities in this flat plate type of die design. For instance, if a larger section than the extruder bore is required, it can be obtained simply by adding a flat plate spreader to

another flat plate approach to the flat plate die orifice. Where excessive dead-end areas are encountered, a slight angle, say ½° or even less if it is uniform, can be cut into the back side of the die orifice plate in the approximate projected area of the approach.

The simplest and last part of this basic die design system is the clamping ring. As illustrated in Fig. 4, it is a plain ring with an opening which encompasses the extremities of the largest circular and slotted types of die bases.

Tubes and Cored Shapes

Dies for producing tubes and cored shapes are just as simple to design and make. Again, a single plate is inserted in the pack behind the die plate. This plate acts as a web and supports the coring shapes, which *should* be streamlined and comparatively long landed. Sizing or inflating air pressure is easily designed for at this point through straight drilled holes.

A simple holder for these plates may be necessary when such shapes as refrigerator door gaskets are being extruded. Adjustment screws are located in this holder so that they contact the edges of the desired plate, thereby enabling the operator to alter the relationship between the outside shape of the extrusion and its cored shape.

Main purpose of this paper has been to put forth a basic concept for extrusion tool design. That the concept is sound is indicated by experience with the extrusion of polyvinyl chloride, polyethylene, polystyrene, methacrylate, cellulose acetate, cellulose acetate butyrate, and ethyl cellulose. All of these materials extrude with nearly equal efficiency from the same basic design.

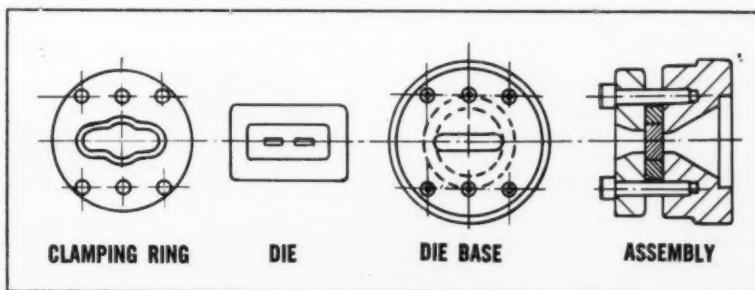


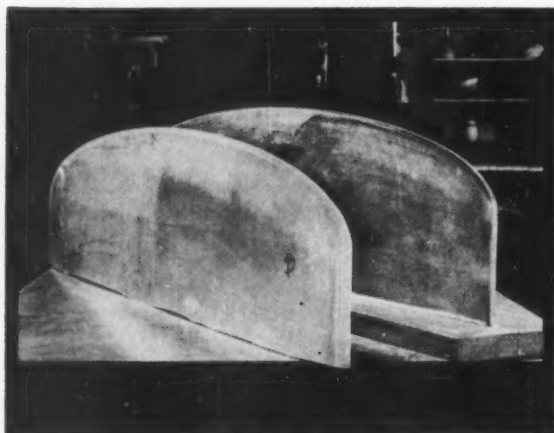
Fig. 4—Principle of universality in design is here illustrated by a step-up for extruding flat strip. The two-orifice die is made from common flat ground stock



Matched phenolic dies for metal forming of aircraft parts, cast from Marblette resin #78, accurately conform to the original blueprint details.



Large metal parts like this aluminum gas tank are hydroformed on dies of dimensionally stable resin #78.



Lay-up molds of resin #78 are utilized to produce polyester-impregnated fibrecloth wing tips by the bag molding process.



Pattern duplicates for mass-production latex dipping are made from phenolic resin #71 to slim down girdle manufacturing costs.

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PLASTICS*

TECHNICAL SECTION: Dr. Gordon M. Kline, Technical Editor

Properties of Plastics Films

by Murray C. Slone† and Frank W. Reinhart‡

The properties of 168 samples of commercially available plastics films from 27 manufacturers were measured. The results of tests to determine tensile, tear, folding endurance, water absorption, water vapor permeability, low temperature impact, change in linear dimensions on heating, specific gravity, and flammability properties are summarized. The results indicate the range of properties available for various types of plastics films and also the limitations of some of the test procedures commonly used.

Table I—Plastic Film Samples Evaluated

Material designation	Type of plastic	Number of samples	Number of suppliers	Range of nominal thickness mils
A	Cellophane	29	2	0.9 - 1.6
B	Cellulose acetate	29	4	0.88 - 10
C	Cellulose acetate butyrate	5	1	0.9 - 2
D	Cellulose triacetate	8	1	1 - 10
E	Ethyl cellulose	3	1	5 - 10
F	Polyethylene	24	8	1 - 10
G	Polystyrene	3	2	0.9 - 10
H	Polyester	4	1	0.25 - 3
I	Saran	7	2	1 - 2
J	Polyvinyl alcohol	1	1	- 2 -
K	Polyvinyl chloride (including copolymers)	53	10	1 - 10
L	Polyvinyl chloride-saran laminate	1	1	- 4 -
M	Polymethyl methacrylate	1	1	- 10 -

Table II—Groups of Samples of Plastic Films Differing Only in Thickness

Material and group designation	Type of plastic	Nominal thickness mils
B a	Cellulose acetate	0.88, 1, 1.5, 2
B b	Cellulose acetate	0.88, 1, 1.5, 2
B c	Cellulose acetate	3, 5, 7.5, 10
B d	Cellulose acetate	5, 7.5, 10
C e	Cellulose acetate butyrate	0.9, 1.1, 1.3, 1.6, 2
D f	Cellulose triacetate	3, 5, 7.5, 10
D g	Cellulose triacetate	1, 1.2, 1.5, 2
F h	Polyethylene	1, 1.5, 2, 3
F i	Polyethylene	1.5, 2, 3, 4
F j	Polyethylene	1.5, 2, 3, 4
H k	Polyester	0.25, 0.5, 1, 3
K l	Polyvinyl chloride	4, 6, 8

INFORMATION on the properties of commercially available plastics films is needed by government and private technical development groups to aid them in selecting films for their specific applications and by purchasing agencies to aid them in preparing specifications and procuring the particular plastics films needed. The data available in the past have not been complete or comparable. Some manufacturers have supplied little or no test data concerning their plastics films, and in many cases where data have been available, they have not been comparable because different methods, equipment, and techniques were used. This project was undertaken to measure the physical and permanence properties of various plastics films under controlled and uniform test conditions.

The samples obtained for evaluation are listed in Table I in 13 general classifications according to the basic type of plastic. A total of 168 samples were received from 27 different manufacturers. Each item submitted by a manufacturer is designated as a sample. Thus even if several thicknesses of the same material were submitted, each thickness is treated as an individual sample. The letter designations are used throughout this report to preface the sample numbers and identify the type of plastic.

Samples of materials in various thicknesses are valuable for detecting trends in the test results caused by thickness variation. Wherever results of tests with such groups are analyzed, only groups containing three or more members are considered. These thickness groups are listed in Table II and each group is

* Reg. U. S. Pat. Off.

† Organic Plastics Section, National Bureau of Standards.

designated by a lower case letter which is used in the discussions of the individual tests. The samples in each group are identical except for thickness.

Since samples of the same type of material from various manufacturers are not always comparable, the wide range of results observed in certain tests should not be construed as indicating either that the test is not precise or that the type of material under consideration cannot be precisely manufactured or is subject to wide fluctuations. The differences are attributable to differences in formulation and processing.

Sampling

In this report the nominal thickness is the thickness reported by the manufacturer. In several instances, samples were supplied without the

nominal thicknesses being indicated. For these samples the nominal thicknesses reported were estimated from the measured values.

The specimens were taken from each sample according to a pattern, shown in Fig. 1, which was designed to give a good representation of a large area of the sample for each test. Also several samples were received too late to be included in all tests. For these reasons the average values reported may not include results for all samples in all tests. However, the more important tests were made with all the samples. All specimens were conditioned prior to testing for at least 48 hr. at 23° C. and 50% relative humidity, and all tests were conducted at these same conditions unless otherwise specified in discussion of individual tests.

Except for a few very narrow rolls, no specimens were taken nearer than 2 in. from the edge of the rolls. However, as noted by the offset in Fig. 1, one of the two number 8 specimens was taken at the edge of the roll. This is in accordance with A.S.T.M. D 1204-52T. Whenever possible and practicable, samples were tested for a property in a random order. Where not all samples of a type were tested for a property, samples were selected to give a good representation of thick-

ness, production treatments, color, appearance, and manufacturers, and to give a good coverage of the range of results expected for the property being evaluated.

Tests were made to determine tensile properties, tear strength, folding endurance, water absorption, water vapor permeability, low-temperature impact, change in linear dimensions, specific gravity, and flammability. The test program is outlined in Table III, in which the test methods are given for each property. The methods of test are described in publications of the American Society for Testing Materials (1)¹, Federal Specifications L-P-406 (2) and UU-P-31 (3), and the Commercial Standard for General Purpose Vinyl Plastic Film CS192-53 (4).

It was not possible to make all tests with all of the samples because of the large number of samples submitted. In some cases only typical samples of a film type were tested.

Tensile Properties

The tensile properties of the plastics films were determined by two methods. These methods are those most generally used.

Static-weighting constant-separa-

¹ Numbers in parenthesis link to references at end of article.



Fig. 1—Pattern for sampling of test specimens of plastics films. Numbers refer to property designations which are listed in Table III, right

Table III—Test Program on Plastic Films

Property	Method of test	
	American Society for Testing Materials	Federal Specification L-P-406 (Plastics)
1. Tensile		
1.1 Static-weighting constant-separation	D 882, procedure B	1013
1.2 Pendulum-weighting constant-motion	D 882, procedure B	1013
2. Folding endurance	D 643	132a
3. Tear		
3.1 Elmendorf	D 689	170a
3.2 S.P.I.-A.S.T.M. static-weighting	D 1004	1121
3.3 S.P.I.-A.S.T.M. pendulum-weighting	D 1004	1121
4. Water absorption	D 570	7031
5. Water vapor permeability	D 697	7032
6. Low temperature impact	b	b
7. Change in linear dimensions	D 1204	....
8. Specific gravity	D 792	....
9. Flammability	c	c

^aMethod of test in Federal Specification UU-P-31 (Paper).

^bParagraph 4.9 in Commercial Standard for General Purpose Vinyl Plastic Film CS192-53.

^cParagraph 4.10 in Commercial Standard for General Purpose Vinyl Plastic Film CS192-53.

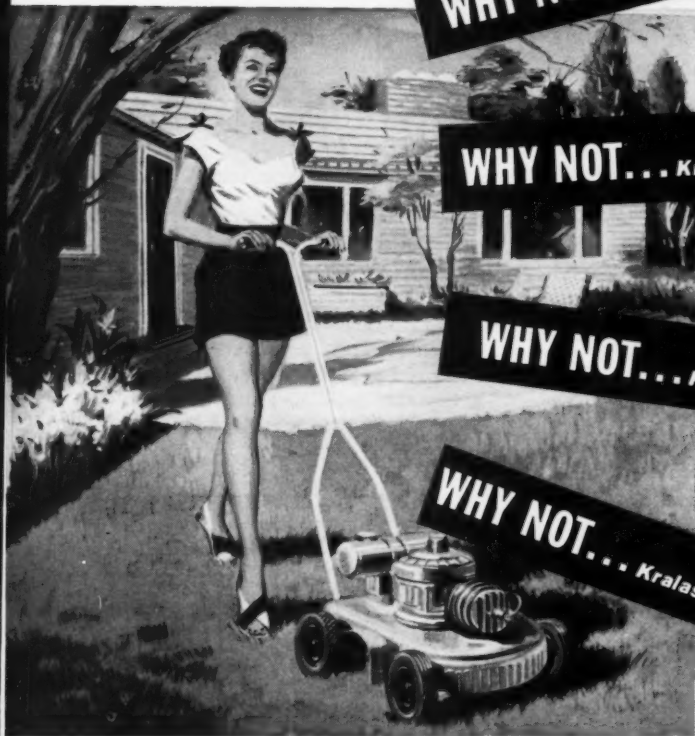
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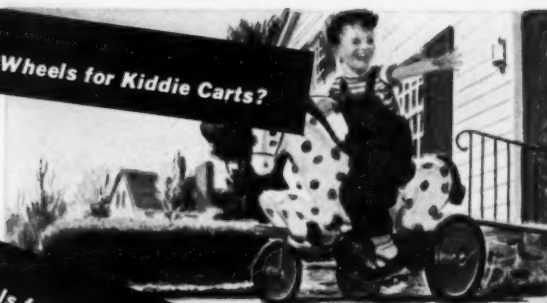
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Table IV—Summary of Tensile Properties of Plastic Films
(Static-Weighing Constant-Separation Method)

Material designation	No. of samples	Lengthwise				Crosswise			
		Tensile strength		Elongation		Tensile strength		Elongation	
		Average	Range ^a	Average	Range ^a	Average	Range ^a	Average	Range ^a
		10 ³ lb./in. ²	10 ³ lb./in. ²	%	%	10 ³ lb./in. ²	10 ³ lb./in. ²	%	%
A	29	101	78-126	13	8.3-19	59	44-81	32	16-55
B	29	81	58-115	24	3.8-48	75	54-108	28	5.5-60
C	5	49	47-50	27	18-33	49	41-48	36	33-38
D	8	98	78-114	14	4.4-31	90	73-105	20	7.3-58
E	3	78	70-83	39	25-46	74	68-79	40	25-49
F	24	22	17-28	350	105-570	16	11-20	615	310-770
G	3	96	84-115	4	3.0-4.8	86	71-107	4	3.3-5.0
H	4	181	168-193	70	41-105	201	185-221	52	39-63
I	7	58	43-92	58	20-140	64	42-105	31	21-42
J	1	50	—	260	—	47	—	270	—
K	53	27	15-40	210	95-340	26	14-40	280	175-415
L	1	40	—	62	—	37	—	54	—
M	1	115	—	6	—	120	—	9	—

^aValues are those for a sample and not for an individual specimen.

tion tensile method—The test was made in accordance with A.S.T.M. D 882-52T, using a 5000-lb. Baldwin MTE motor-driven testing machine. The 50-lb. load range, minimum scale division of 0.05 lb., was used in the majority of the tests, and the 200-lb. range, minimum scale divi-

sion of 0.2 lb., was used for heavier samples where necessary. Ten specimens in both lengthwise and crosswise directions were prepared for each sample. Two of these specimens were taken from each area designated as 1.1 in Fig. 1. The test specimens were 1 by 6 inches. The

initial grip separation was 2 in., and the initial rate of jaw separation was 2 in./minute. This rate was used until the specimen had elongated 100 percent. At this point the rate was increased to 20 in./minute. The total elongation was measured to the nearest 0.05 in. by measuring the

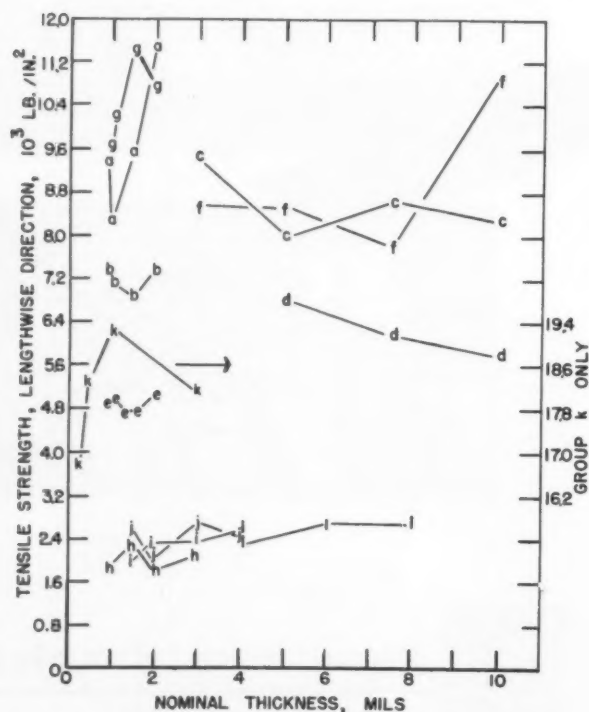


Fig. 2—Results of tests of tensile strength in the lengthwise direction, using the static-weighing, constant-separation method, for groups of similar samples of plastics film. Refer to Table II, p. 203, for explanation of sample letter designations

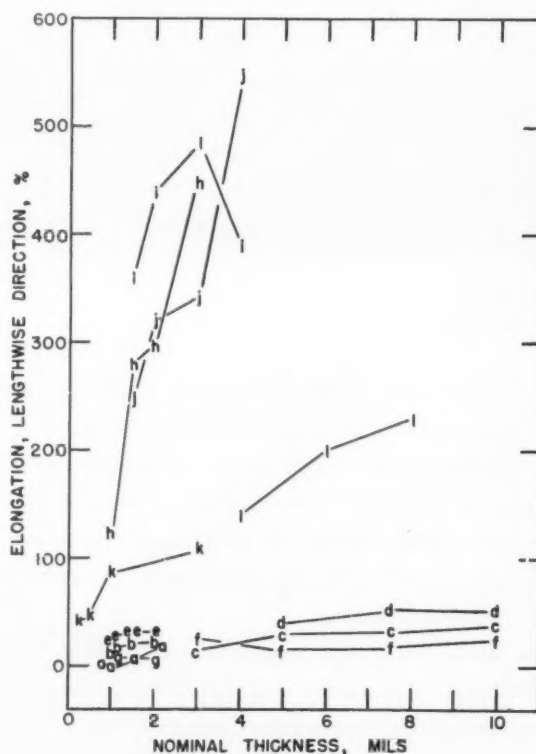
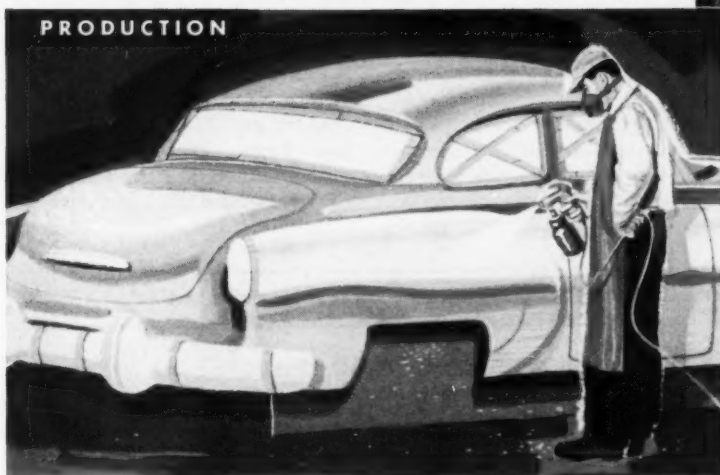


Fig. 3—Elongation (static-weighing, constant-separation method) for groups of similar samples of plastics film (see Table II)

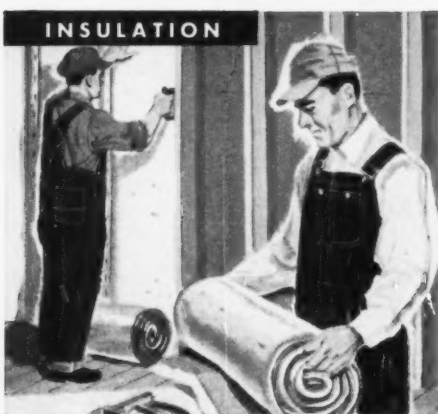
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jaw separation at the instant of rupture.

A summary of the tensile properties of the various types of materials is given in Table IV.* The results of tensile strength and elongation at break, in the lengthwise direction, for groups of similar samples are given graphically in Figs. 2 and 3,* respectively. From the random shape of the curves in Fig. 2, there does not appear to be a dependency of tensile strength on thickness in the range indicated. In Fig. 3, it is apparent that a definite relationship exists between elongation and thickness except for the cellulose derivatives.

Pendulum-weighting constant-motion tensile method—The test was made in accordance with A.S.T.M. D 882-52T, using a motor-driven pendulum-type machine. Most of the samples were tested on the low-load range, 15 lb. maximum, 0.05 lb. minimum scale division. The stronger samples were tested with the high-load range of 75 lb. maximum, 0.2 lb. minimum scale division.

* See p. 206 for Table IV, Figs. 2 and 3.

sion. The speed of the lower jaw of the testing machine was 20 in./minute. With a 2-in. initial jaw separation, the maximum travel of the lower jaw was 6 in. and the maximum elongation was 4 in., or 200 percent. Five specimens in both the lengthwise and crosswise directions were prepared from each sample, specimens 1,2 in Fig. 1. The test specimens were 0.59 in. wide by 6 in. in length. A grip separation of 2 in. was used initially for all materials except the polyethylene for which a 1-in. separation was used. With samples of types J, K, and L, one specimen of each direction was tested with an initial grip separation of 2 in., and if the specimen did not break within the limit of travel of the jaw, the other specimens were tested at a grip separation of 1 inch.

The average results for the various materials are given in Table V. The strength values are calculated using the measured thicknesses of the individual specimens. Many of the specimens did not break even when tested with a 1-in. jaw separation. Elongation values could be

obtained only for those materials which broke within the range of the instrument. For samples of materials J, K, and L, which were initially tested at 2-in. jaw separation, and then tested at 1-in., the results in the tables are the average of four tested at the 1-in. initial separation. With groups of three or more samples differing only in thickness, only the thinnest and thickest were tested.

Folding Endurance

The folding endurance was measured in accordance with A.S.T.M. D 643-43, Method B, using the MIT Folding Endurance Tester. In this test method, specimens taken from area 2 of Fig. 1, are clamped securely between two jaws and a load is applied through the upper jaw by a spring mechanism. The lower jaw oscillates at a fixed rate through an angle of 135° to both the left and the right of the position of zero fold. The specimen is folded over the rounded edge of this lower jaw. These folding edges are of 0.015 ± 0.001-in. curvature. The (To page 212)

Table V—Summary of Tensile Properties of Plastic Films (Pendulum-Weighting Constant-Motion Method)

Material designation	No. of samples	Lengthwise direction				Crosswise direction			
		Tensile strength		Elongation		Tensile strength		Elongation	
		Average	Range ^b	Average	Range ^b	Average	Range ^b	Average	Range ^b
		10 ³ lb./in. ²	10 ³ lb./in. ²	%	%	10 ³ lb./in. ²	10 ³ lb./in. ²	%	%
A	29	142	104-186	23	14-36	84	59-105	59	43-77
B	22	97	71-133	34	7-80	90	65-139	39	12-81
C	2	65	64-66	42	41-43	62	61-97	50	44-56
D	4	127	109-136	20	15-25	115	97-125	23	17-28
E	3	93	84-106	50	48-55	94	86-106	58	57-59
Fa	7c, d	28	24-35	290	180-345	—	—	—	—
	2c, d	—	—	—	—	23	20-26	—	—
	11c, e	21	13-30	—	—	—	—	—	—
	16c, e	—	—	—	—	15	12-16	—	—
G	3	116	115-119	3	3-4	110	95-121	10	5-18
Ha	1d	218	—	69	—	253	—	70	—
	1e	231	—	—	—	279	—	—	—
I	7	93	67-142	76	20-131	109	80-148	54	25-119
J	1c	61	—	—	—	60	—	—	—
Ka	4d	28	21-33	—	—	—	—	—	—
	2e	—	—	—	—	30	29-31	—	—
	20c, d	35	26-54	285 ^f	230-385	—	—	—	—
	12c, d	—	—	—	—	31	17-46	380 ^g	350-400
	28c, e	31	18-54	—	—	—	—	—	—
	38c, e	—	—	—	—	30	15-56	—	—
L	1c	65	—	205	—	70	—	195	—
M	1	121	—	11	—	123	—	15	—

*Samples that broke in the test and those that did not are averaged separately.

^bValues are the average for a sample and not an individual specimen.

^cInitial grip separation was 1 in. in these tests; in all others 2 inches.

^dAverage for samples in which all specimens broke.

^eAverage for samples in which only some of specimens broke.

^fAverage of 16 samples.

^gAverage of 4 samples.

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Cabflex® ODA	<i>iso-octyl decyl adipate</i>	improved low temperature permanence in vinyl compounds
Cabflex® DDA	<i>di-decyl adipate</i>	new low temperature diester with low volatility and high efficiency
Cabflex® Di-OZ	<i>di-iso-octyl azelate</i>	low volatility, good water immersion properties impart excellent low temperature permanence
Cabflex Di-BA®	<i>di-iso-butyl adipate</i>	non-toxic, approved for use in vinyl food wrappings by Food & Drug Administration
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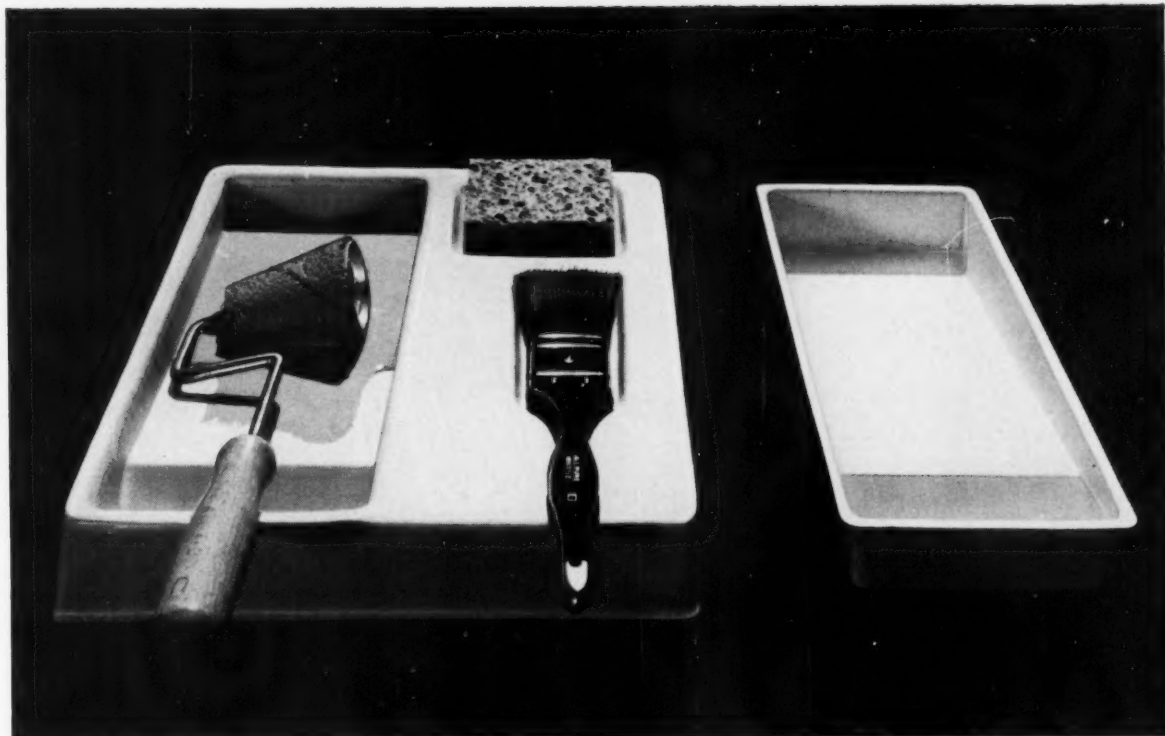


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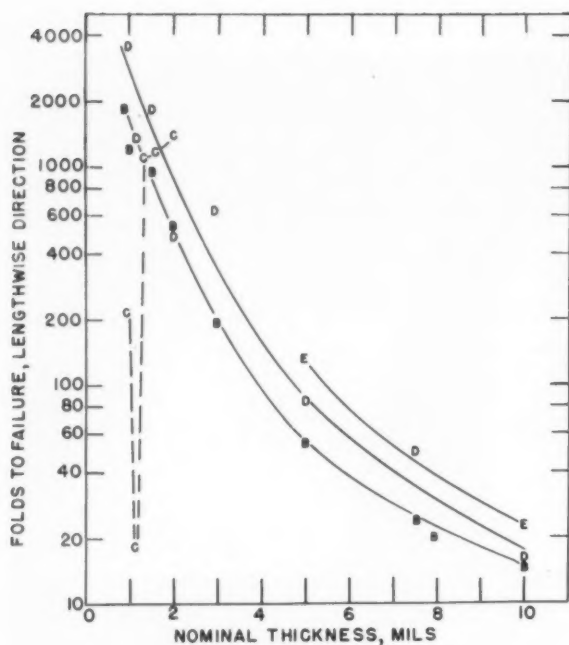


Fig. 4—Folding endurance (MIT folding tester) of four materials. Refer to Table I, p. 203, for explanation of material designations

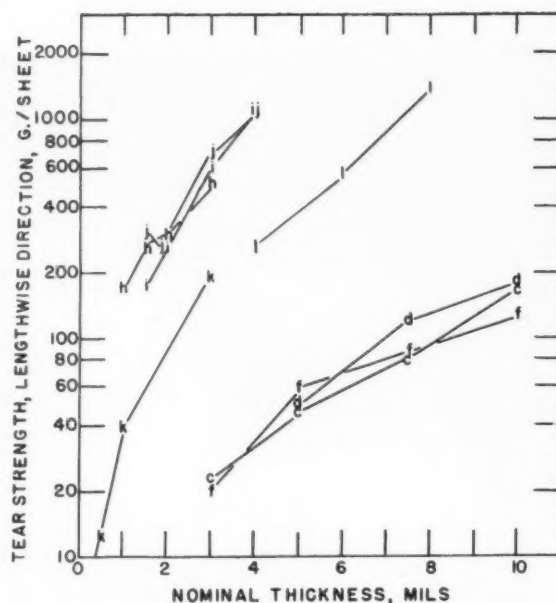


Fig. 5—Results of tests of internal tear strength in the lengthwise direction, using the Ellendorf method, conducted on groups of similar samples of plastics film. Refer to Table II, p. 203, for an explanation of sample letter designations

clamping device in the lower jaw is below the axis of rotation so no clamping pressure is exerted within $\frac{3}{8}$ in. of the folding edges. Each complete cycle of a bend to the left and a bend to the right is counted as one fold, and the number of folds is registered by a counting device. A tensile load of 1 kg. is applied to the specimen, and the oscillating frequency is 180 cycles/minute. The test specimen is 0.59 by 6 inches.

It was originally planned to test all samples by this test method. However, certain materials exhibited an ability to be folded for an extremely high number of folds. For these materials, representative samples only were tested. Specimens of these samples were folded for a period of 1 hr., approximately 10,800 folds. For several samples of this type, a few of the specimens broke prematurely; that is, before the 1-hr. test operation was completed. These specimens usually ran for less than 1000 folds before failing. This may be attributed to imperfect specimens of materials that are very notch sensitive. The tests were conducted on ten specimens in each direction of each sample or until five specimens did not break in a 1-hr. test, whichever occurred first. The re-

verse of the above effect was also noted in several cases. One or more of a set of specimens would fold for 1 hr., and the remaining specimens would fail well within the hour.

The results indicate that the method is not adaptable for testing all types of plastics films. Complete information was not obtained for some materials, such as the polyester, saran, and vinyl plastic films. It was only at a thickness of 10 mils that test results were obtained for polyethylene. The wide differences obtained with approximately similar samples of the same thickness and the extremely large standard deviation values make the results of the tests of cellophane of doubtful value. However, the results of the tests of cellulose acetate, cellulose acetate butyrate, cellulose triacetate, and ethyl cellulose plastics are such as to indicate the applicability of the test method to these materials.

Plots of the average values for these last four materials, B, C, D, and E, are given in Fig. 4. It is to be expected that the folding endurance of a material would decrease with increasing thickness, and the curves for all the materials except the cellulose acetate butyrate plastic show this relationship. The different behavior of this latter

material, compared with the other materials, may be attributed to its tensile strength. At a load of 1 kg., the stress is approximately 4300 lb./in.², and this is very near to the tensile strength. Therefore, at these low thickness levels, the applied load is a bigger factor in causing failure than with thicker films. It would be expected that at greater thicknesses, this plastic film, C, would produce a curve similar to that obtained for materials B, D, and E.

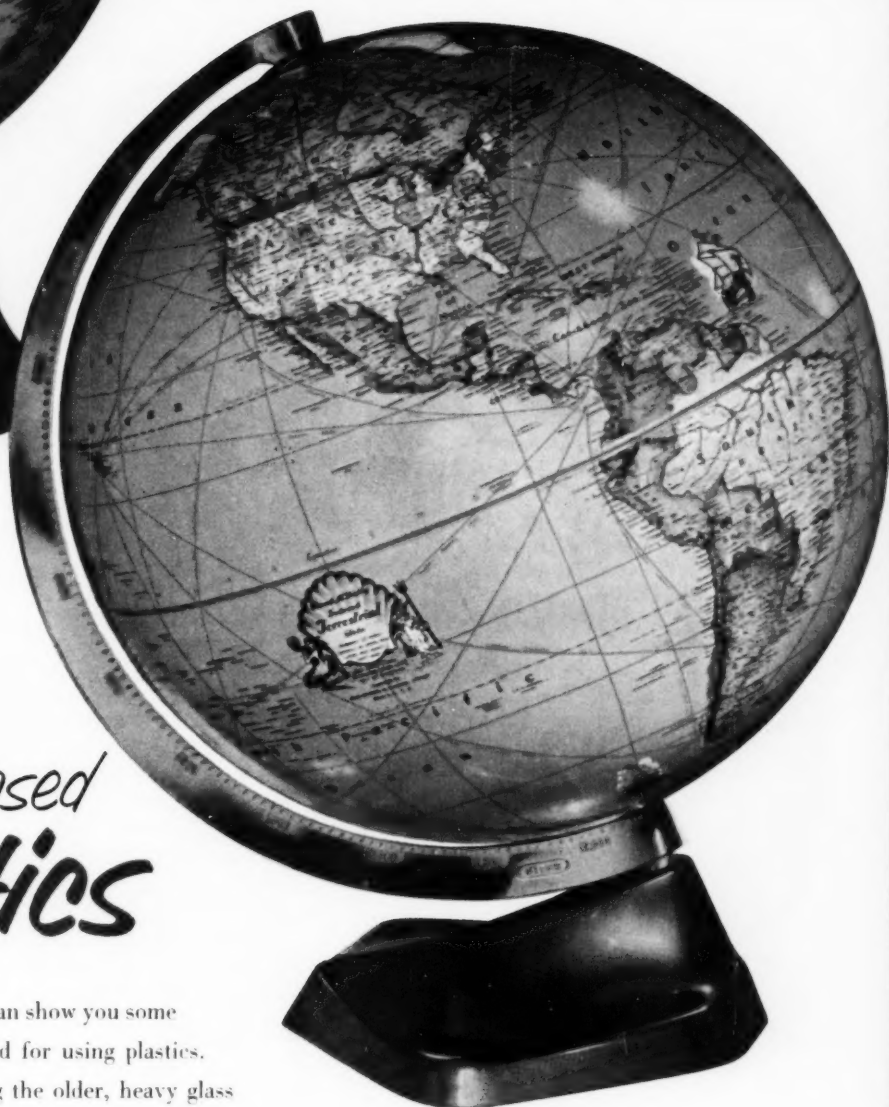
Tear Strength

The tear strength of the plastics films was determined by three methods. These methods are those most generally used.

Ellendorf tear strength method—The internal tear resistance was measured in accordance with A.S.T.M. D 689-44. The work done in tearing a sheet or sheets through a fixed distance is measured after an initial tear of definite dimensions has been made in the test specimen with a sharp blade. In most cases, ten specimens, specimen 3.1 of Fig. 1, were torn for each sample. The low tear strength of some of the films often made it necessary to tear more than one sheet in a single test. The number of sheets torn as a unit



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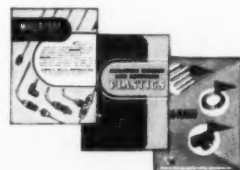
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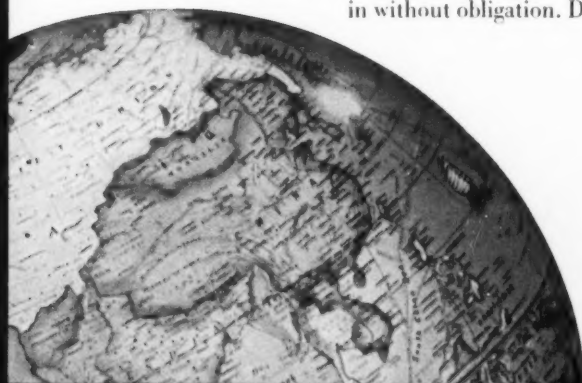
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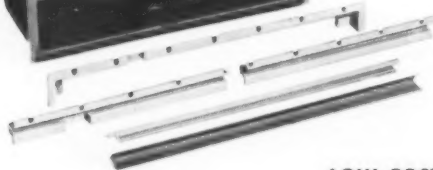
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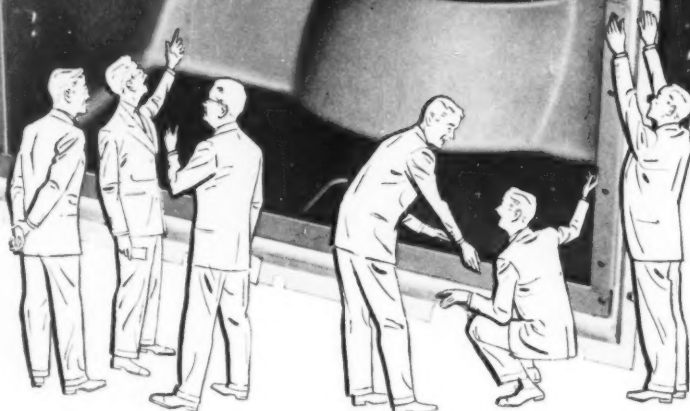


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is governed by the desirability of obtaining an instrument scale reading in the middle 60% of the scale. Although some samples were torn in groups of ten sheets, they did not give results in this range.

The test method specifies that readings obtained in tests in which the tear deviates more than 10 mm. from the line of initial slit shall be rejected. With the plastic films tested, some materials tore consistently at an angle such that the values should be rejected. However, because these tears were in not just a single specimen, but occurred in most or all specimens of a particular sample, the results are included. The tear strength values for the specimens that had these deviating tears were generally greater than those obtained with the specimens that tore as required by A.S.T.M. D 689-44.

The range of the test instrument can be increased by adding weights to the pendulum arm, in which case a maximum strength value of 3200 g. can be obtained. Several samples had tear strengths above this value and could not be torn. Where only

one specimen of a sample did not tear within the instrument range, the value for that specimen was neglected in averaging the tear strength of the sample.

The tear strength as obtained in this test is expressed in grams per sheet and is dependent on the thickness of the sheet. Some of the results for the lengthwise tear strength are shown graphically in Figs. 5 and 6. Figure 5, p. 212, contains several groups in which the samples differ only in thickness. The values for groups a, b, e, and g are not shown because the values for all the thicknesses of these groups are nearly identical so that when plotted in this manner, the separate points are indistinguishable. Figure 6 has curves for several of the types of materials. The results for materials B, C, and D, follow the same general curve, as is to be expected since they are all compositions based on cellulose derivatives. One of the values for material K is abnormally high; the reason for this anomalous behavior is not known.

S.P.I.-A.S.T.M. static-weighting tear strength method—The test was

made in accordance with A.S.T.M. D 1004-52T, using a static-weighting machine and a constant rate of grip separation. This test provides for the measurement of the tear strength of flexible plastic film and sheeting from 0.001 to 0.075 in. thick. The specimens used in this test are designed to give a high stress concentration at the center of the specimen. This tear strength value is to some extent a measure of the notch sensitivity of the material and is a function of the tensile strength, elongation, and shear strength of the material. The width of the specimen at the level of the stress concentration notch is fixed by the specification. The tearing strength is defined as the tearing force per unit thickness and is reported in pounds per inch. All specimens were tested singly with an initial grip separation of 2 in. and a rate of grip separation of 20 in./minute.

Ten specimens in both the lengthwise and crosswise direction were prepared from film cut from area 3.2 of Fig. 1. The test specimens were cut by means of a steel die having the dimensions specified in

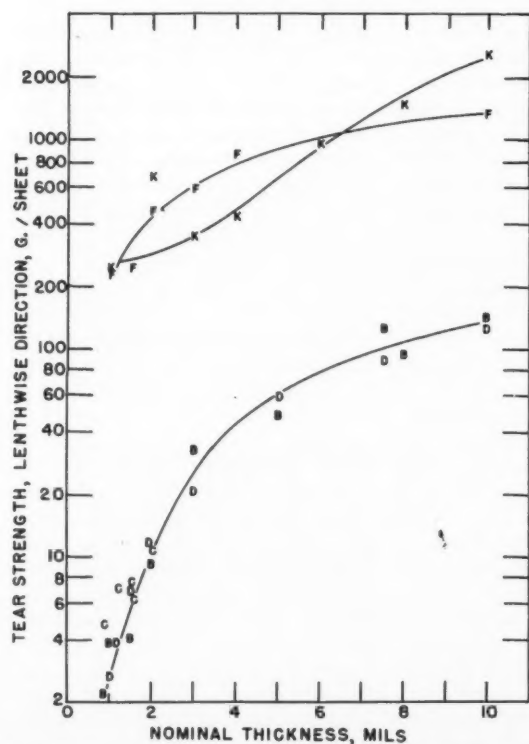


Fig. 6—Internal tear strength (Ellendorf method) of plastics films. Refer to Table I, p. 203, for explanation of material designations

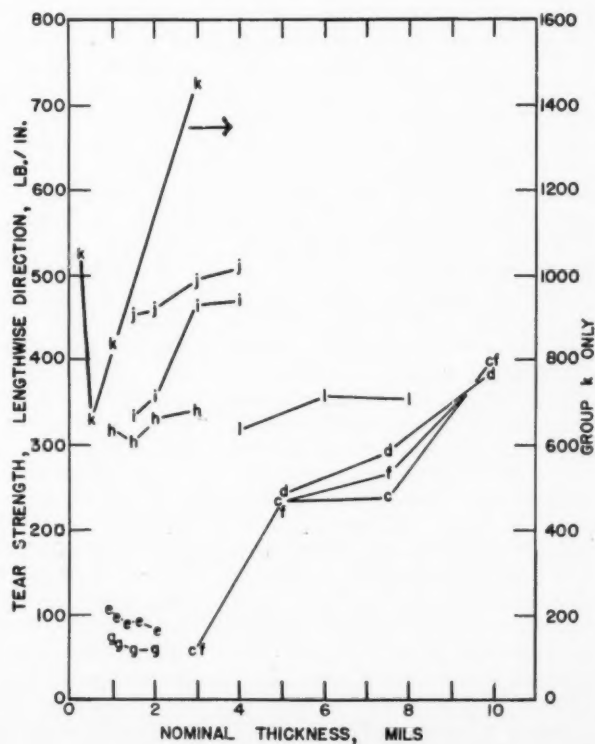


Fig. 7—Tear strength (S.P.I.-A.S.T.M. static-weighting method) for groups of similar samples of plastics films. (See Table II, p. 203)

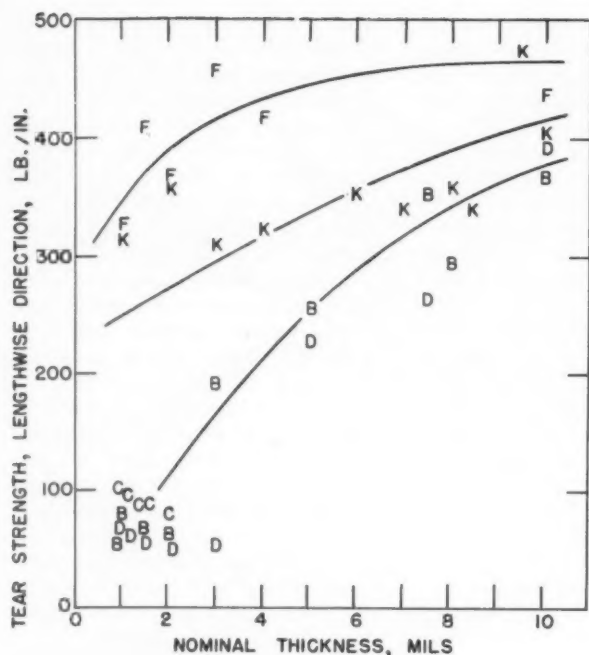


Fig. 8—Results of tests of tear strength in the lengthwise direction of various groups of similar samples of plastics film, using the S.P.I.-A.S.T.M. static-weighting method. Refer to Table I, p. 203, for an explanation of the material letter designations

the test method. Normally only one test specimen was cut from each of the pattern specimens, 3.2, but with some of the stiffer samples, particularly cellulose acetate, polystyrene, and polymethyl methacrylate, crazing and splitting occurred at the notch, thus making it necessary to cut two specimens from the same pattern specimen. For some samples, it was still not possible to obtain ten good test specimens.

Tearing loads are given to the nearest 0.1 lb., and the tear strength is calculated using the average measured thickness of the individual test specimens. It is observed that there are no values of load less than 0.1 lb; in no case was the test result on an individual specimen lower than 0.08 lb. regardless of the material thickness. This can be interpreted to mean that tear load values less than 0.1 lb. cannot be accurately determined by this method. As a result, some of the very thin samples may have an apparent higher tear strength than similar samples of slightly greater thickness. This is shown graphically in Figs. 7 and 8. Figures 7, p. 215, gives tear strength for various groups of similar samples, Fig. 8 gives the tear strength

for several of the materials having a large number of samples. In both of these graphs there is a definite apparent decrease in tear strength of the low strength films with increasing thickness in the range of 2 mils and under. At higher thicknesses and strengths, the values of tear strength for all materials were found to increase with increasing thickness.

A summary of the tear strength values of the various plastic films is given in Table VI, p. 218. It indicates that the tear strength is not independent of thickness, and that these groups do not contain an even distribution of samples over the entire thickness range. The ranges of values in this table are probably of more significance than the average results.

S.P.I.-A.S.T.M. pendulum-weighting tear strength method—The test was made in accordance with A.S.T.M. D 1004-52T, utilizing a motor-driven machine of the pendulum type. A load range of 15 lb., minimum scale division of 0.05 lb., was used for all tests. The rate of travel of the lower jaw was 20 in./min., and an initial jaw separation of 2 in. was used. Five speci-

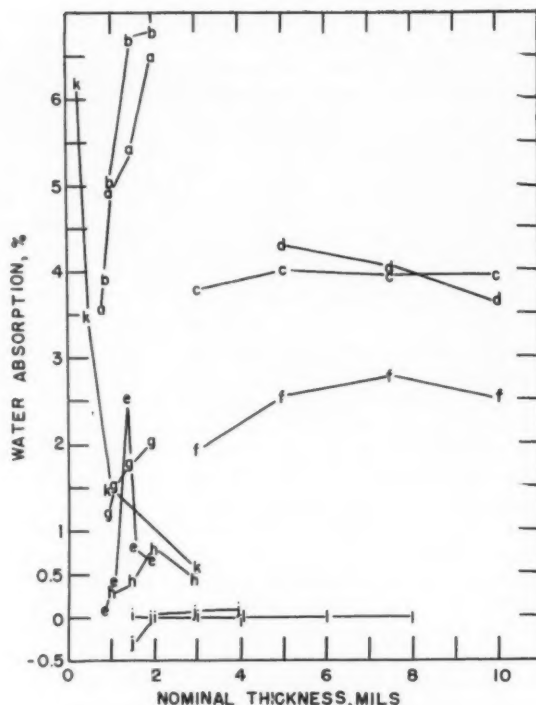


Fig. 9—Water absorption for groups of similar samples of plastics film. Refer to Table II, p. 203, for sample designations

mens in both the lengthwise and crosswise directions were prepared, specimen 3.3 of Fig. 1. The specimens were cut by means of a steel die having the dimensions specified in the test method. Normally, one test specimen was cut from each pattern specimen, but in some cases it was necessary to cut more than one to obtain a sufficient number of good specimens. Specimens were tested singly for all samples.

With the groups of similar samples differing only in thickness, only the thinnest and the thickest samples were tested. The average results for the types of films are summarized in Table VII, p. 218.

Water Absorption

Water absorption was measured in accordance with A.S.T.M. D 570-42, except for conditioning. This method of test measures the relative amount of water absorbed by plastics when immersed completely in water for 24 hours. Three test specimens, 1 by 3 in., were tested for each sample. These are shown as specimen 4 of Fig. 1. The specimens were conditioned at 23° C. and 50% relative humidity for at least 24 hr. prior to testing. Each specimen

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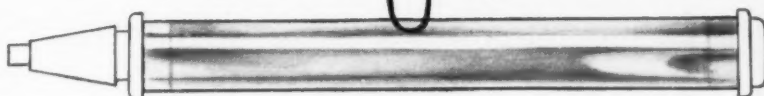


Table VI—Summary of Tear Strength of Plastic Films (S.P.I.-A.S.T.M. Static-Weighing Method)

Material designation	Type of plastic	No. of samples	Tear strength			
			Lengthwise		Crosswise	
			Average	Range ^a	Average	Range ^a
			lb./in.	lb./in.	lb./in.	lb./in.
A	Cellophane	28	175	110 to 515	145	110 to 205
B	Cellulose acetate	25	245	55 to 415	225	50 to 385
C	Cellulose acetate butyrate	5	90	80 to 105	90	80 to 95
D	Cellulose triacetate	8	150	55 to 395	135	50 to 360
E	Ethyl cellulose	3	330	215 to 395	340	245 to 395
F	Polyethylene	24	405	215 to 575	280	65 to 455
G	Polystyrene	2	360	270 to 450	385	270 to 495
H	Polyester	4	1000	665 to 1450	1105	650 to 1740
I	Saran	5	215	120 to 330	225	80 to 465
J	Polyvinyl alcohol	1	890	.....	785	.....
K	Polyvinyl chloride	53	345	175 to 490	295	110 to 480
L	Polyvinyl chloride-saran laminate	1	405	.....	370	.....
M	Polymethyl methacrylate	1	340	.....	380	.....

^aIndividual values are results for a sample and not individual specimens.

Table VII—Summary of Tear Strength of Plastic Films (S.P.I.-A.S.T.M. Pendulum-Weighing Method)

Material designation	Number of samples	Tear strength			
		Lengthwise		Crosswise	
		Average	Range ^a	Average	Range ^a
		lb./in.	lb./in.	lb./in.	lb./in.
A	29	795	605 - 940	590	420 - 810
B	22	325	95 - 655	345	115 - 595
C	2	295	170 - 415	305	190 - 415
D	4	440	325 - 555	360	230 - 545
E	3	500	385 - 590	490	390 - 565
F	18	485	350 - 665	430	300 - 510
G	3	550	425 - 715	500	325 - 710
H	2	2025	1735 - 2310	2230	1323 - 3135
I	7	405	245 - 605	450	195 - 755
J	1	980	.....	1065	.....
K	52	395	225 - 620	350	185 - 585
L	1	465	.....	470	.....
M	1	760	.....	665	.....

^aValues are the averages of five specimens for each sample and not values for individual specimens.

was weighed and immersed in a separate container of distilled water for a period of 24 hours. The specimens were then removed from the water and, after being weighed, were reconditioned at 23° C. and 50% relative humidity for 7 days.

The results of the test are given in Table VIII, p. 223. The increase in weight values reported are the increases in weight resulting from the 24-hr. immersion in water. This value is the water absorbed less the soluble material lost to the water. The reconditioning period of 7 days allows the specimen to reach essentially the same equilibrium moisture conditions as before immersion. Therefore, if no soluble material were lost to the water, the initial

weight and the reconditioned weight would be the same. The amount of soluble material lost is the difference between the initial and reconditioned weights. This difference should always be a positive quantity within the limits of error of the method. The water absorption is the sum of the increase in weight on immersion and soluble matter lost.

The thickness of the specimens was also measured before and after immersion. The thickness of each specimen was measured in three places and the results averaged. The thickness gage used had a minimum scale division of 0.0001 in. or 0.1 mil. This reduced the precision of the measurements on the change in thickness for some of the thinner

films, but a good indication of the effect of the immersion is obtained. From the data it is seen that only the cellophane and the polyvinyl alcohol have values large enough so that the materials can be considered to be definitely affected. A statistical analysis of the individual specimen and sample results is not readily made on this property. Variations in the results depend on the accuracy of the thickness gage, which is only $\pm 10\%$ for films 1 mil in thickness, and also on the thickness variations within the samples, which is known in some cases to be greater than the changes observed.

The values of water absorption for the groups of similar samples are given in Fig. 9, p. 216. For each group of samples the water absorption versus thickness curve seems to follow a definite pattern, but there does not seem to be any over-all trend. For the groups with increasing film thickness, some have increasing water absorption values, some have decreasing values, and some are relatively constant. Even among groups of the same material, such as a, b, c, and d, there are very pronounced differences in the type of curve obtained.

Water Vapor Permeability

Water vapor permeability was determined in accordance with A.S.T.M. D 697-42T, Method A, desiccant method. A brass ring, 17 mm. deep and enclosing an area of 30 sq. cm., was centered in a 3.75-in. diameter Petri culture dish and held

(To page 223)



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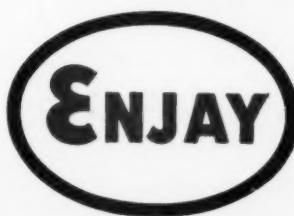
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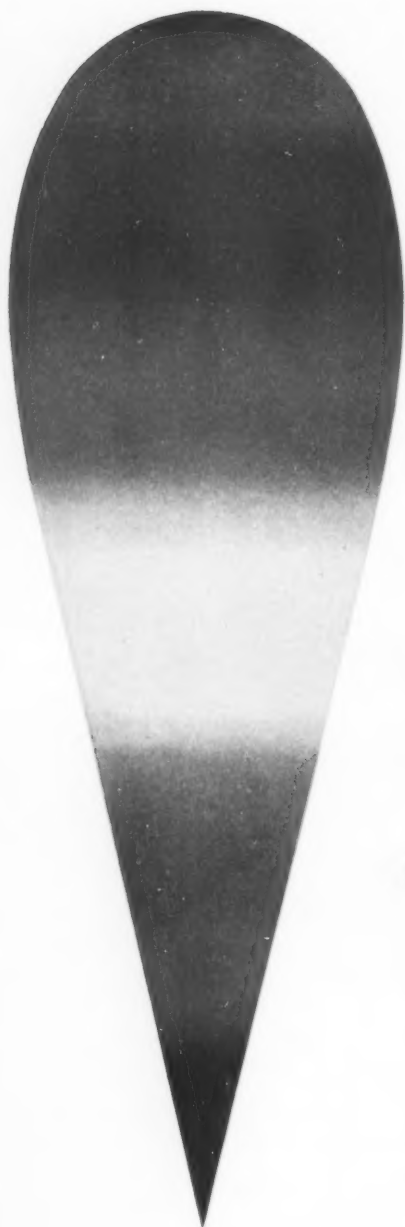
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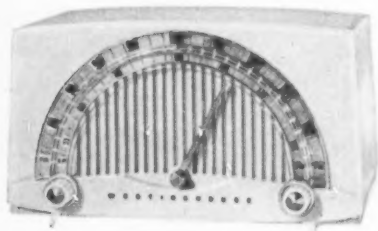
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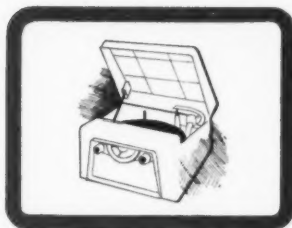
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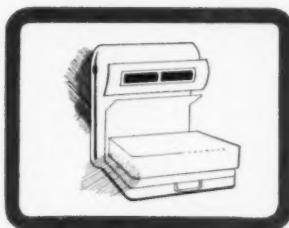
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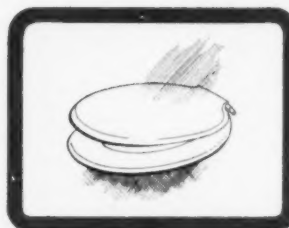
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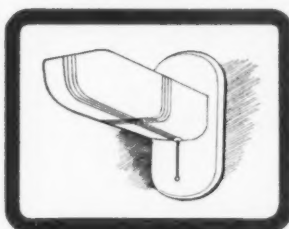
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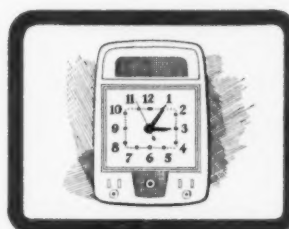
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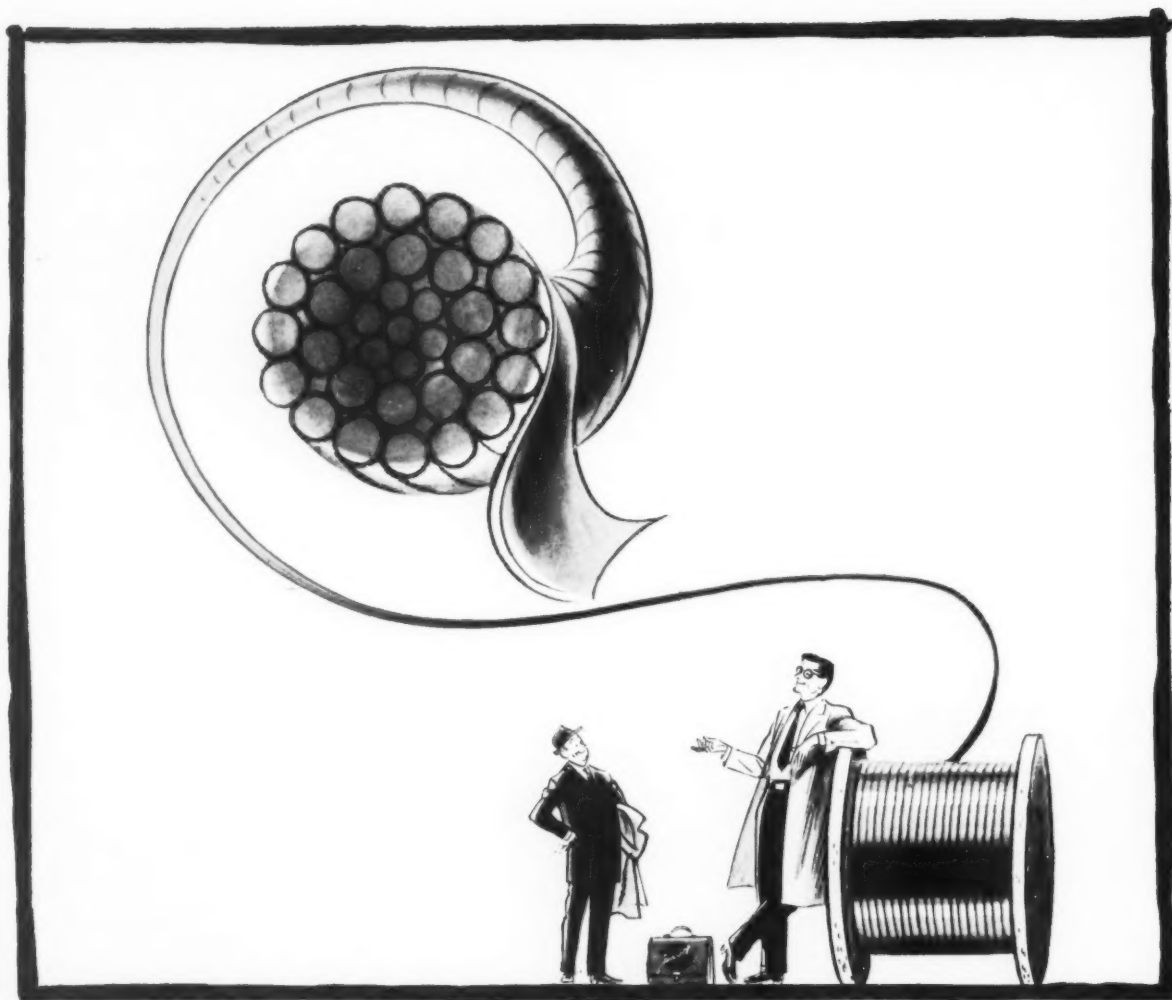
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Table VIII—Summary of Water Absorption of Plastic Films

Material designation	No. of samples ^a	Increase in weight ^b		Soluble material lost ^c		Water absorption ^d		Increase in thickness ^e	
		Average	Range ^f	Average	Range ^f	Average	Range ^f	Average	Range ^f
		%	%	%	%	%	%	%	%
A	29	72.8	37.7 to 94.5	12.8	6.8 to 20.3	85.7	44.7 to 114.8	67	6 to 101
B	29	-0.6	-16.4 to 5.9	5.5	-0.2 to 20.4	4.9	3.6 to 6.8	-1	-12 to 4
C	5	-2.5	-4.4 to -0.9	3.4	1.4 to 5.1	0.9	0.1 to 3.4	-4	-10 to 3
D	8	0.4	-1.7 to 2.0	1.6	0.4 to 3.6	2.1	1.2 to 2.8	0	-5 to 3
E	3	6.8	5.6 to 7.5	-0.3	-0.5 to -0.1	6.8	5.6 to 7.5	1	0 to 2
F	24	0.0	-0.6 to 0.8	0.1	-0.5 to 0.9	0.2	-0.3 to 0.8	1	-3 to 10
G	3	1.6	-0.1 to 4.8	0.2	0.1 to 0.2	1.8	0.1 to 5.0	-3	-6 to 0
H	4	2.2	0.6 to 4.7	0.7	-0.2 to 1.5	3.0	0.6 to 6.2	-4	-12 to 0
I	7	1.5	0.1 to 3.3	0.5	-0.1 to 1.5	2.0	0.5 to 3.5	2	-4 to 8
J	1	66.5	.....	13.8	.....	80.3	.....	19	.....
K	53	0.9	-0.4 to 6.6	0.2	-0.9 to 0.5	1.0	0.0 to 5.9	0	-5 to 5
L	1	0.1	.....	0.2	.....	0.3	.....	-1	.....
M	1	0.6	.....	0.4	.....	1.0	.....	0	.....

^aThree specimens tested per sample.

^bIncrease from original weight on 24 hr. immersion in water.

^cDecrease from original weight after 7 days of reconditioning at 23° C. and 50% relative humidity.

^dSum of "increase in weight" and "soluble material lost".

^eIncrease in thickness on 24 hr. immersion in water.

^fValues of range are those for average of a sample and not values for individual specimens.

in place with a 1:1 mixture of beeswax and rosin. An aluminum template was used to position the specimen on the ring after the dish had been filled with anhydrous magnesium perchlorate. The specimen was sealed into place by the same type of beeswax-rosin mixture. Three specimens, specimen 5 in Fig. 1, of each sample were tested. The specimens were weighed initially and periodically thereafter until the rate of weight increase became constant. The length of time varied from a few days up to 10 days or more. Because of the length of time required to conduct this test, only representative samples of each type of material were tested.

The average results for the types of plastic film are presented in Table IX. Of the three specimens tested per sample, two of the specimens were put face up, or in contact with the air, at 50% relative humidity and one was placed with the face down, or in contact with the dry air over the desiccant. The face of the material was selected arbitrarily and at random except for type L, the laminated sample, for which the vinyl plastic film was selected as the face side. There did not appear to be a difference in the results between the specimens having the face up and the face down. The vapor pressure of the water on the desiccant side of the film was taken as zero for calculating the perme-

Table IX—Water Vapor Permeability of Plastic Films

Material designation	Type of plastic	Number of samples	Permeability constant ^a	
			Average	Range ^b
A	Cellophane			
	Nonmoistureproof	2	2.04	1.42 - 2.65
	Intermediate-moistureproof	1	1.23	.....
	Moistureproof	6	0.18	0.01 - 0.73
B	Cellulose acetate	11	6.18	1.44 - 8.78
C	Cellulose acetate butyrate	2	5.51	4.53 - 6.48
D	Cellulose triacetate	4	5.61	4.77 - 6.01
E	Ethyl cellulose	2	13.35	12.54 - 14.15
F	Polyethylene	10	0.06	0.04 - 0.08
G	Polystyrene	3	0.62	0.50 - 0.70
H	Polyester	2	0.10	0.08 - 0.11
I	Saran	3	0.02	0.01 - 0.03
J	Polyvinyl alcohol	1	0.10	.....
K	Polyvinyl chloride	11	0.92	0.35 - 2.01
L	Polyvinyl chloride-saran	1	0.04 ^c	.....
	laminated			
M	Polymethyl methacrylate	1	0.53	.....

^aExpressed as grams transmitted in 24 hr. by an area of 1 m.² through a film 1 mm. thick and with a pressure differential of 1 cm. of mercury.

^bIndividual values are results for a sample and not individual specimens.

^cCalculated using over-all sample thickness. The value is 0.01 calculated on the thickness of the saran film alone.

ability constant. The differences in permeability of the different types of cellophane are very apparent. The permeability constant of the vinyl plastic-saran laminate is calculated on the total thickness of the sample. If the permeability is calculated on the basis of the thickness of the saran film, 1 mil, the constant is 0.01, which agrees fairly well with the values for other saran films.

Impact resistance at low tempera-

tures was measured in accordance with paragraph 4.9 of CS192-53. In this test method a 2- by 5¾-in. specimen is folded lengthwise on itself and fastened together ½ in. from the open ends. The looped specimen is placed on an anvil and a 6-lb., 13-oz. pendulum hammer of 1-ft. length is allowed to fall through 90° onto the specimen. The criterion of failure in this test is the breaking of the specimen into

Table X—Summary of Changes in Linear Dimensions of Plastic Films on Heating at 100° C. for 30 Minutes

Material designation	No. of samples ^a	Change in linear dimensions			
		Average	Lengthwise Range ^b	Average	Crosswise Ranged
		%	%	%	%
A	29	-1.47	-0.83 to -2.60	-1.98	-0.75 to -42.0
B	29	-0.80	-0.23 to -3.01	-0.43	+0.22 to -1.64
C	5	-2.17	-1.72 to -3.03	-0.27	+0.10 to -0.48
D	8	-0.43	-0.15 to -0.75	-0.21	-0.03 to -0.55
E	3	-0.33	-0.13 to -0.68	-0.16	-0.03 to -0.43
F	24	-6.62	-1.23 to -19.92	+2.44	+10.43 to -0.50
G	3	-16.98	-4.86 to -37.38	-15.33	-4.60 to -26.40
H	4	-0.37	-0.20 to -0.48	-0.56	-0.30 to -0.75
I	7	-22.37	-16.40 to -32.06	-20.59	-15.16 to -29.50
J	1	-3.22	.....	-3.12	.....
K	51	-4.39	-0.88 to -9.52	+1.47	+4.16 to -3.85
L	1	-6.05	.....	-0.03	.....

^aTwo specimens tested for each sample.

^bIndividual values are results for a sample and not individual specimens.

two or more pieces along the line of the loop. Three specimens in the lengthwise direction, specimen 7 of Fig. 1, of each sample were tested. The specimens were looped and fastened to heavy cards at room temperature. The specimen-card assembly was conditioned for 1 hr. at the test temperature of 0° F. (-17.8° C.) prior to testing.

For the samples which fractured, all three specimens failed, and similarly for those which did not break, none of the three specimens broke. All samples of the cellulose acetate,

cellulose triacetate, and ethyl cellulose plastic failed regardless of thickness, but only the thickest (2 mils) sample of the cellulose acetate butyrate failed. The thickest (10 mils) sample of polystyrene was flattened out so that the specimens broke at the crease mark when the loop was spread open. None of the other samples failed in this test.

Linear Dimensions

The change in linear dimensions was measured in accordance with A.S.T.M. D 1204-52T. This test pro-

vides for the measurement of changes in the linear dimensions of thermoplastic sheeting or film that result from exposure of the material to an elevated temperature. This test procedure is particularly applicable to material made by an extrusion or calender process as it gives an indication of lot-to-lot uniformity with regard to the degree of internal strains introduced during processing. The test method does not specify temperature and time conditions for various materials, but instead states that the specimens shall be placed "in the oven at the temperature and time applicable for the material being tested." The Commercial Standard for General Purpose Vinyl Plastic Film CS192-53 specifies test conditions of 100° C. for 30 minutes. As these conditions are not unduly severe and so as to have a basis of comparison, all materials were tested at these conditions. It is realized that these conditions may be much more severe for some materials than for others.

Two specimens were tested for each sample, specimen 8 of Fig. 1. No differentiation was made between the two specimens as to location within the sample. The specimens after testing were reconditioned at 23° C. and 50% relative humidity for 48 hr. before noting changes in linear dimensions.

The results are summarized for

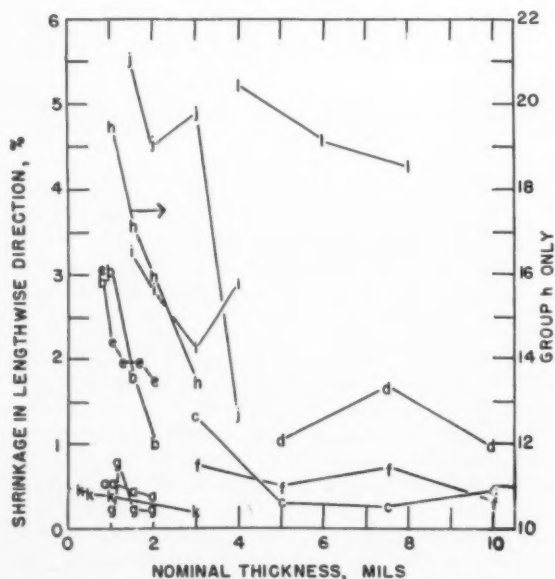


Fig. 10—Changes in linear dimension for groups of similar samples of plastics film. Consult Table II, p. 203, for material designations

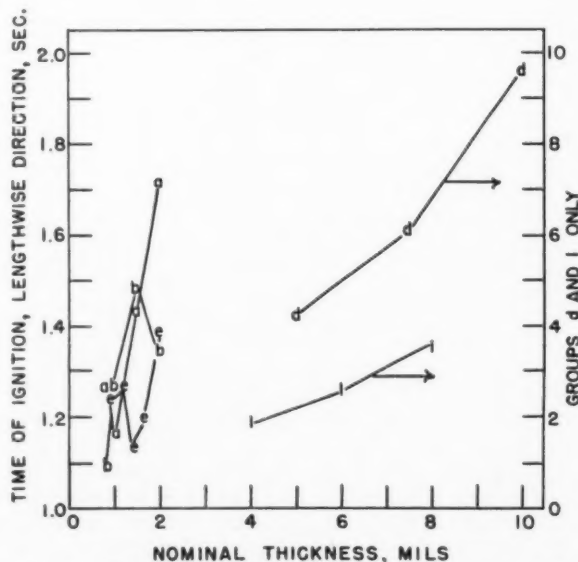
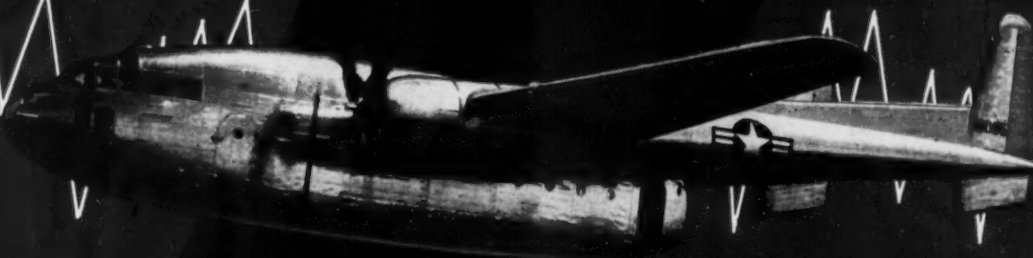


Fig. 11—Results of tests of time of ignition for groups of similar samples of plastics films, indicating that time of ignition increases with increasing thickness. For rate of burning, see Fig. 12, p. 380. Refer to Table II, p. 203, for explanation of sample designations

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Table XI—Summary of Specific Gravity of Plastic Films

Material designation	Type of plastic	No. of samples	Specific gravity ^a	
			Average	Range ^b
A	Cellophane	29	1.45	1.40 - 1.50
B	Cellulose acetate	29	1.31	1.28 - 1.43
C	Cellulose acetate butyrate	5	1.20	1.19 - 1.20
D	Cellulose triacetate	8	1.30	1.29 - 1.31
E	Ethyl cellulose	3	1.13	....
F	Polyethylene	24	0.92	0.91 - 0.92
G	Polystyrene	3	1.05	1.05 - 1.06
H	Polyester	4	1.39	....
I	Saran	7	1.64	1.59 - 1.71
J	Polyvinyl alcohol	1	1.24	....
K	Polyvinyl chloride	53	1.29	1.24 - 1.45
L	Polyvinyl chloride-saran laminate	1	1.38	....
M	Polymethyl methacrylate	1	1.19	....

^aSpecific gravity relative to that of distilled water at 23°C.^bValues are average values obtained with three specimens of each sample.

the various types of plastics in Table X. The results for the groups of similar samples are shown graphically in Fig. 10. The change in the lengthwise direction is used since it generally had the greater dimensional change and was always a negative value. The inverse relationship between thickness and shrinkage is very noticeable in most cases. Each type of material was analyzed for variations with thickness, and a qualitative relationship

similar to that mentioned above was found. It cannot be overstressed that this property, probably more than any other property evaluated, is a function not so much of the material itself but of the method and procedure of manufacturing.

Specific Gravity

The measurement of specific gravity was made in accordance with A.S.T.M. D 792-50. This method measures the specific gravity by

determining the weight of a specimen in air and in a liquid of known specific gravity. Distilled water was used as the immersing liquid in all cases except for the polyvinyl alcohol, in which case the liquid was n-heptane. The specific gravities for the various plastics are summarized in Table XI. The specimens were approximately 3 in. square, specimen 9 of Fig. 1. Three specimens were tested for each sample. In no instance did the specific gravity of any one specimen of a sample differ from the average value for the sample by as much as 0.01, and in most cases the range of the three measured values was less than 0.01. The results of this work show that the measurement of specific gravity is not affected by the thickness of the material, which is as expected if the liquid wetted thoroughly the surface of the test specimens.

Flammability

Flammability was determined in accordance with paragraph 4.10 of CS192-53, using the flammability tester developed by The Society of the Plastics Industry. All tests were conducted in a hood with the adjustable air vents on the tester open, and the door of the tester closed. The only deviations from the prescribed test method were: 1) the hood fan remained on during the tests, and 2) American Thread Co. button and carpet thread was used instead of J and P Coats Co. heavy duty thread. It is not expected that these deviations would affect the results appreciably. Five specimens of each sample were tested in both the lengthwise and crosswise direction except for sample 172, tested only in the lengthwise direction.

The results of tests are summarized in Table XII. All samples were tested, but some did not burn sufficiently to obtain measurements. Several of these samples would ignite but would not support their own combustion, and others would not ignite at all. The comparative results for the groups of similar samples are presented graphically in Figs. 11 and 12. In Fig. 11 it is seen that the time for ignition increases with film thickness, and Fig. 12 shows that the rate of burning decreases with increasing film thickness. The temperature of combustion also tends to increase with increas-

(To page 380)

Table XII—Summary of Flammability of Plastic Films

Material designation	No. of samples which burned ^a	Ignition time		Burning rate		Temperature of combustion	
		Average	Range ^b	Average	Range ^b	Average	Range ^b
		sec.	sec.	in./sec.	in./sec.	°F.	°F.
Lengthwise direction							
A	29	2.30	1.85-3.66	1.63	0.72-2.32	178	155-216
B	18	3.58	1.09-9.63	1.13	0.34-2.15	190	122-281
C	5	1.25	1.13-1.38	1.56	1.01-2.39	130	118-137
D	3	5.65	4.19-7.06	0.32	0.28-0.38	195	182-215
E	3	5.84	3.31-7.68	0.44	0.36-0.55	236	172-273
J	1	3.16	....	0.86	....	179	....
K	17	2.37	1.02-4.10	0.76	0.16-1.51	169	128-248
M	1	3.85	....	0.12	....	200	....
Crosswise direction							
A	29	2.10	1.60-3.24	1.55	0.72-2.12	179	157-209
B	18	3.72	1.11-8.71	0.90	0.26-1.58	196	122-306
C	5	1.23	1.03-1.42	1.42	0.99-1.87	133	129-141
D	3	5.64	4.34-7.18	0.30	0.24-0.38	192	178-216
E	3	5.66	3.40-7.07	0.43	0.33-0.55	231	175-281
J	1	3.07	....	0.85	....	181	....
K	17	4.31	2.27-7.13	0.92	0.49-1.69	171	133-250
M	1	....^c	....	....^c	....	....^c	....

^aAll samples were tested. Some samples were self-extinguishing and others would not ignite. Values reported are for the samples which burned.^bValues are the results for a sample and not for individual specimen.^cNot tested in the crosswise direction.

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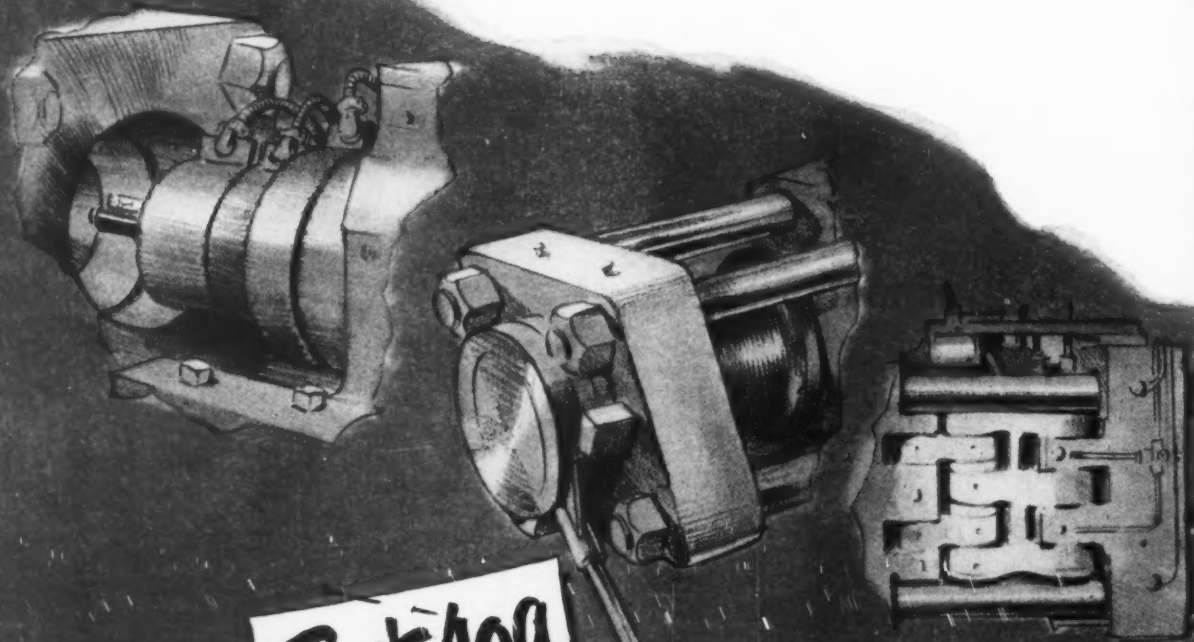
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PLASTICS DIGEST*

Abstracts from the world's literature of interest to those who make or use plastics or plastics products. Send requests for periodicals to the publishers listed.

General

PLASTICS MATERIALS SALES INCREASING. Brit. Plastics 27, 1-5 (Jan. 1954). The production of plastics in Britain in 1953 recovered from the 1952 drop. The biggest factors in this recovery were the sale of molding powders, particularly polystyrene, but not cellulose acetate, phenol-formaldehyde, or urea-formaldehyde; unplasticized vinyl and other resins in various forms were also important contributors. Prices of plastics materials remained fairly constant in 1953 with a noticeable over-all downward trend.

EIGHTH SWEDISH PLASTICS CONFERENCE. Plastics (London) 19, 15-17, 27 (Jan. 1954). Short summaries are presented of eleven papers given by British delegates at the Plastics Conference in Stockholm in Nov. 1953. These papers covered the subjects of injection molding, transfer molding, glass-fiber laminates, polyester resins, polyvinyl chloride, and polyethylene.

Materials

SANDWICH MATERIALS. K. Rose. Materials & Methods 39, 117-32 (Mar. 1954). A broad survey of available sandwich materials, properties, applications, and fabrication is presented. Included are facing materials, structural strength laminates, core materials, insulating laminates, and various special purpose laminates. The text is supplemented with photographs, charts, and graphs illustrating engineering properties and techniques.

CHEMICAL AND PHYSICAL PROPERTIES OF ALKYL ARYL PHOSPHATES. H. R. Gamrath, E. R. Hatton, and W. E. Weesner. Ind. Eng. Chem. 46, 208-12 (Jan. 1954). The chemical and physical properties of the alkyl diaryl phosphates are described. Considering that they are esters of an inorganic acid, they exhibit good stability and other excellent charac-

teristics in comparison with esters in general. The alkyl diaryl phosphates are chemically intermediate between trialkyl and triaryl phosphates and their properties are also intermediate. Alkyl diaryl phosphates are useful as plasticizers, especially for polyvinyl chloride and polyvinyl copolymers. The economic value of these compounds is the substitution of lower cost aryl groups for essentially functional equivalent alkyl groups.

A NEW FIRE-RESISTANT POLYESTER. Materials and Methods 39, 98-101 (Feb. 1954). A new line of polyester resins is available with improved flame resistance. When tested in accordance with ASTM E-84, the polyester without a filler has a flame spreading rating superior to red oak. With antimony oxide filler, laminates are good enough to qualify as an acceptable interior material under most building codes. Drawbacks to the resins are their slightly higher costs than regular polyesters and poorer resistance to light aging. Other physical and chemical properties are similar to regular grade polyesters. The resins are based on a new dibasic acid containing 55% chlorine. Fabrication and service properties are described.

NEW POLYESTER FILM. R. C. Krueger. Materials & Methods 39, 104-106 (Mar. 1954). The physical and electrical properties of Mylar (polyethylene terephthalate) polyester film are described. The material has high tensile strength, tear resistance, flex life, and impact strength. It possesses excellent electrical insulating properties over a wide range of temperatures from -75 to 300° F., has a long-term resistance to heat, and is chemically inert. Mylar film transmits more than 90% of incident light in the visible region of the spectrum and cuts off sharply in the ultra-violet at 3150 Å, the so-called biologically active region of

the spectrum. The properties of Mylar film find particular application in the electrical field, e.g., for motor insulation and as a base for magnetic sound-recording tapes, pressure-sensitive industrial tapes, cap and drum linings, plastic glazing, and packaging.

COLOR UNIFORMITY IN LOW-PRESSURE LAMINATES. P. Fran, T. F. Dunne, and F. Leonard. Ind. Eng. Chem. 46, 393-96 (Feb. 1954). Color non-uniformity presents a definite disadvantage in low-pressure laminates, especially when they are used to make artificial limbs for amputees. The development of standardized laminating techniques and color shade guides is of importance from the cosmetic point of view. To make possible the manufacture of a uniformly colored laminate, some of the variables in the procedure were studied. It was found that in pastel flesh shades an increase in the promoter concentration causes a marked red-to-yellow shift. Furthermore, variations in the curing treatment produce decided color changes. Once a standard procedure was established for obtaining consistent color reproduction without loss in the desirable laminate properties, the assessment and development of pleasing color shade guides were investigated. The correlation of laminate color with pigment concentration was established and pigment formulations were found which give the desired laminate color. As a result of this work it is now possible to make available to the amputee population artificial limbs that are not only functional in design but also cosmetically improved. The method and techniques described are pertinent, in general, to the color uniformity problems of low-pressure laminating.

Molding and Fabricating

INEXPENSIVE VACUUM-FORMING OF SHEET THERMOPLASTICS. Brit. Plastics 27, 18-19 (Jan. 1954). An inexpensive machine for vacuum forming thermoplastic sheet materials is described.

TRENDS IN EXTRUSION MACHINERY. E. G. Fisher. Brit. Plastics 26, 392-99 (Nov. 1953). Recent developments in extrusion machining, with respect to screws, barrels, adaptors, and drive units are discussed. These developments include a more scien-

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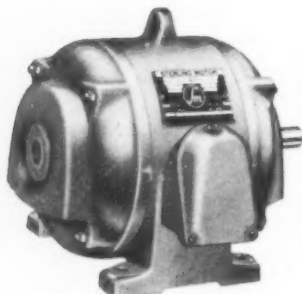


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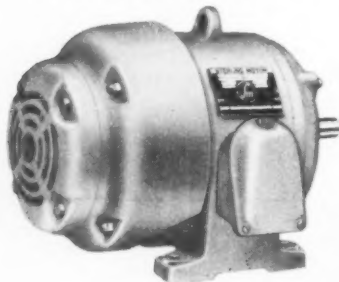
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Applications

POLYETHYLENE - COATED GLASS FLASKS. G. A. Simmons, Jr. Analytical Chem. 26, 248 (Jan. 1954). A procedure is given for lining the inside of glass vessels with a polyethylene coating.

NEW EPOXY PRIMER HAS HIGH RESISTANCE TO ALKALIES. H. L. Farber. Materials & Methods 39, 93-95 (Feb. 1954). An epoxy resin primer is now being applied to washing machine parts and shows improved corrosion resistance over the alkyd primer previously used. The epoxy film, only $\frac{1}{8}$ the thickness of the alkyd film, is applied by flow-coating as opposed to the spray-coated alkyd primer. Several other advantages are more uniform coating, less finishing and sanding, better adhesion to the base metal, and better abrasion resistance. The coating technique is described.

PRODUCTION STORY. Plastics (London) 19, 5-7 (Jan. 1954). The steps in the manufacture of a plastic radio cabinet from the drawing-board stage to the finished item are described briefly.

STEEL-REINFORCED PVC HOSE. Brit. Plastics 27, 20 (Jan. 1954). The extrusion of flexible polyvinyl chloride hose reinforced by an embedded steel spring is described. It is extruded on a single-screw cross-head machine.

POLYETHYLENE WATER PIPES. Plastics (London) 19, 18-19 (Jan. 1954). The use of polyethylene pipe for emergency water supply lines for Civil Defense operations is described. Polyethylene was selected because of its light weight, toughness, and stability during extended storage.

EXTRUSIONS IN TERRAZZO FLOORS. Brit. Plastics 27, 16-17 (Jan. 1954). Polyvinyl chloride extrusions offer a

wide color range of dividing strips for terrazzo floors and walls. The grade of polyvinyl chloride used for these strips has the same wearing qualities as terrazzo floor and, therefore, wears evenly with the floor. Metal or ebonite strips offer a very restricted color range and the metal does not wear as much as the terrazzo, thus projecting above the level of the floor after a few years of use, a disadvantage overcome by the plastic strip.

Properties

HIGH-TEMPERATURE RESISTIVITY OF POLYESTER DIELECTRIC FILM. L. E. Ambroski and R. L. Burton. Electrical Manuf. 53, 124-28. (Mar. 1954). The results of a detailed investigation of the resistivity characteristics of Mylar (polyethylene terephthalate) polyester film at temperatures up to 240° C., in relation to voltage and film thickness, are reported. The volume resistivity of Mylar at room temperature is of the order of 10^{19} ohm-cm., about the same as that of polystyrene. However, Mylar retains good resistivity at temperatures up to about 230° C. where polystyrene and polyethylene are useless. Tetrafluoroethylene resin and chlorotrifluoroethylene resin have somewhat higher resistivity values than Mylar at elevated temperatures, but have mechanical limitations in thin section. The resistivity values for nylon and cellulose acetate are considerably below that for Mylar. Resistivity depends upon temperature, voltage, and film thickness. The logarithm of the resistivity of Mylar decreases linearly with increasing temperature, decreasing about one order of magnitude for each 20° C. temperature rise; the slope of the curve decreases slightly above about 215° C., apparently as a result of a change in the degree of crystallinity. The resistivity decreases with decreasing film thickness because the voltage gradient is higher in the thinner film, i.e., the voltage coefficient of resistivity decreases with increasing film thickness.

THREE YEARS' OUTDOOR WEATHER AGING OF PLASTICS UNDER VARIOUS CLIMATOLOGICAL CONDITIONS. S. E. Yustein, R. R. Winans, and H. J. Stark. ASTM Bulletin No. 196, 29-39 (Feb. 1954). The effects of outdoor weather aging under widely differ-

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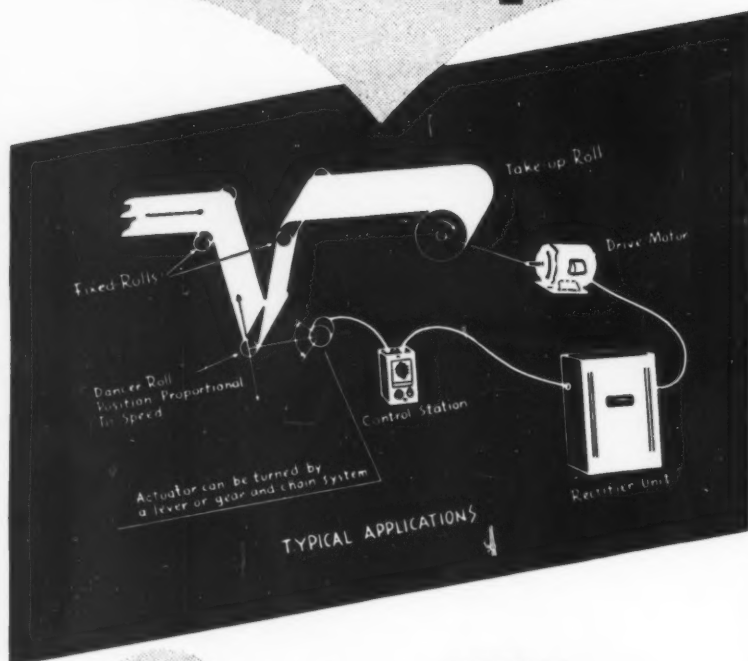
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ent climates are investigated for various types of plastic materials. Five climatological regions are represented in the program which provides for outdoor exposures on sites located in 1) Panama Canal Zone (tropical); 2) New Mexico (dry desert); 3) New York (temperate); 4) Fort Churchill, Canada (subarctic); and 5) Point Barrow, Alaska (arctic). The materials investigated include five types of clear transparent sheet plastics, six types of laminated materials, and five types of molded terminal bars. Various exposure periods from 1 to 36 months were employed, and various mechanical, electrical, and optical properties were evaluated. On the basis of the extensive data accumulated, it is possible to deduce the occurrence of a wide variety of effects that appear to be related to differences in the climatic and environmental conditions and in the exposure periods. On the whole the ability of most of the materials to withstand the 2- or 3-yr. weather aging as well as they did was unexpected. In view of this, it is believed that a 5- to 10-yr. weather aging program is necessary to evaluate properly the outdoor weather aging resistance of many plastic materials. The results of the investigation also indicate the need for further study of several phenomena such as 1) weather aging of materials that may be characterized chiefly by atmospheric contamination; a suggested exposure site for investigation is Pittsburgh, Pa.; 2) behavior of electrical properties of glass laminates under various low-temperature exposure conditions; and 3) weather aging of plastics materials at seacoast sites and inland locations.

Testing

IMPROVED SCALE SYSTEM FOR STIFFNESS TESTING MACHINE. H. LaTour and R. S. Sutton. ASTM Bulletin No. 196, 40-42 (Feb. 1954). Bend or stiffness tests requiring simultaneous readings of load and angle may be made more accurately and with less operator fatigue by mounting a rotatable inverse angle scale directly below the fixed load scale of machines of the Tour-Marshall design. A method of adapting this principle to Tinius Olsen stiffness testers of 6 and 50 in.-lb. capacities is described and illustrated.

The high molecular weight polymers of ethylene, generally known as polythenes or polyethylenes, were first discovered, developed and manufactured by Imperial Chemical Industries Limited and are sold under the trade mark 'Alkathene'.

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P564



U. S. PLASTICS PATENTS

Copies of these patents are available from the
U. S. Patent Office, Washington, D. C., at 25¢ each.

COATING. E. A. Armatys (to Sun Chemical). U. S. 2,668,159, Feb. 2. Plastisol emulsified in thermosetting resin lacquer.

STABILIZER. C. Roney (to Ansul). U. S. 2,668,160, Feb. 2. Stabilizing sulfone resins.

POLYMERS. C. E. Lowe (to Du Pont). U. S. 2,668,162, Feb. 2. Polyhydroxy acetic acid esters.

CATALYSTS. W. B. Reynolds, J. E. Wicklatz and T. J. Kennedy (to Phillips Petroleum). U. S. 2,668,163, Feb. 2. Alkenyl hydroperoxy methane catalysts.

COPOLYMERS. G. H. Swart and T. A. TeGrotenhuis (to General Tire and Rubber). U. S. 2,668,164, Feb. 2. Copolymers of isomeric dichlorostyrenes.

CONDENSATES. J. E. Carpenter (to American Cyanamid). U. S. 2,668,165, Feb. 2. Condensates of fatty acids, polyalkylene polyamines and organic halides.

TUBING. W. J. Johnson (to L. Danenberg and A. Danenberg). U. S. 2,668,323-4, Feb. 9. Treating the interior surface of tubing while extruding; creaseless flattened tubing.

MOLDING. G. R. Goodwin (to Miller Electric). U. S. 2,668,325, Feb. 9. Injection molding machine.

CASTING. F. E. Porter (to U. S. Chemical). U. S. 2,668,328, Feb. 9. Casting patterned sheets.

PACKAGING. H. Rumsey, Jr. U. S. 2,668,403, Feb. 9. Heat-sealed and heat-shrunk plastic package.

HYPODERMIC. G. Barradas and R. H. Motten, Jr. (to PM Industries). U. S. 2,668,534, Feb. 9. Plastic hypodermic.

EDGER. L. M. Budd. U. S. 2,668,568, Feb. 9. A smoothing and edge chamfering machine.

COMPOSITE. E. H. Phreaner (to H. C. White). U. S. 2,668,789, Feb. 9.

Composite of vulcanized rubber and a polyester resin.

VINYL COMPOSITION. F. Johnston (to Carbide and Carbon). U. S. 2,668,800, Feb. 9. Vinyl halide polymer plasticized with a phosphorus containing compound.

COATING. A. C. Schultz (to Stoner-Mudge). U. S. 2,668,801, Feb. 9. Plastisol coating.

RESINS. E. M. Evans and J. E. S. Whitney (to British Resin Products). U. S. 2,668,802, Feb. 9. Polymeric vinyl phenol-formaldehyde resins.

RESINS. L. A. Lantz and A. Schofield (to Calico Printers). U. S. 2,668,803-4, Feb. 9. Polyvinyl aromatic acetals and pigments therefrom.

RESINS. S. O. Greenlee (to Devoe and Raynolds). U. S. 2,668,805, Feb. 9. Polyepoxides having terminal groups composited with polyhydric phenol polyether alcohols.

POLYMERIZATION. R. N. Haward and J. Elly (to Styrene Products). U. S. 2,668,806, Feb. 9. Suspension polymerization.

EPOXIDES. S. O. Greenlee (to Devoe and Raynolds). U. S. 2,668,807, Feb. 9. Epoxide compositions.

RESINS. C. A. Robinson (to Arnold, Hoffman). U. S. 2,668,808, Feb. 9. Guanidine-formaldehyde condensates.

POLYVINYL ALCOHOL. H. W. Bryant and W. R. Cornthwaite (to Du Pont). U. S. 2,668,809, Feb. 9. High viscosity polyvinyl alcohol.

POLYVINYL ESTERS. E. Bergmeister, W. Gruber, and J. Heckmaier (to Wacker-Chemie). U. S. 2,668,810, Feb. 9. Saponification of polyvinyl esters.

MOLDING. R. W. Miller (to Dow). U. S. 2,668,986, Feb. 16. Plastic molding machine.

FILM. J. Bailey, J. Pinskey, and

C. G. Reber (to Plax). U. S. 2,668,988, Feb. 16. Stretching polyethylene film to increase tear strength.

PACKAGING. J. Benz. U. S. 2,669,077, Feb. 16. Apparatus for packaging plastics.

COMPOSITE. M. O. Orr (to B. F. Goodrich). U. S. 2,669,535, Feb. 16. Heat-sealed polyvinyl chloride-acrylonitrile rubber composite.

RESINS. J. R. Darby and L. D. Frederickson, Jr. (to Monsanto). U. S. 2,669,548, Feb. 16. Halogen resins stabilized with a zinc salt.

RESIN. T. H. Vaughan (to Westinghouse). U. S. 2,669,551, Feb. 16. Urea-formaldehyde resin.

RESIN. R. B. Seymour and R. P. Desch (to Atlas Mineral Products). U. S. 2,669,552, Feb. 16. Acid-catalyzed furfural alcohol resin.

COPOLYMER. G. S. Schaffel and K. V. Weinstock (to General Tire and Rubber). U. S. 2,669,553, Feb. 16. Copolymer of a diolefin and a ketone.

CASHEW NUT SHELL LIQUOR. C. F. Armitage (to Colloid Chemical Laboratories). U. S. 2,669,554, Feb. 16. Treating cashew nut shell liquor with fluoboric acid.

HOMOPOLYMERS. J. J. Giammaria (to Socony-Vacuum). U. S. 2,669,555, Feb. 16. Homopolymers of alkyl N-substituted maleimides.

POLYAMIDES. C. A. Sperati (to Du Pont). U. S. 2,669,556, Feb. 16. Bis(amino aryl)methane polyamides.

RESINS. R. M. Wheaton (to Dow). U. S. 2,669,557, Feb. 16. Water-soluble sulfonated vinyl aromatic resins.

MOLDING. R. D. Keeney (to Monsanto). U. S. 2,669,750, Feb. 23. Injection molding devices.

CELLULAR PRODUCTS. J. L. McCurdy and C. E. DeLong (to Dow). U. S. 2,669,751, Feb. 23. Production of cellular thermoplastics.

MOLDING. W. S. Pratt (to Plax). U. S. 2,669,752, Feb. 23. Molding hollow plastic articles.

WELL SEALING. P. L. Menaul (to Stanolind Oil and Gas). U. S. 2,670,048, Feb. 23. Sealing porous wells with acrylic resin.

POLYAMIDES. O. A. Bredeson (to Du Pont). U. S. 2,670,267, Feb. 23.

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Pressure per square inch on material at end of plunger	... 9,100 lb.
Total pressure on Injection plunger	... 18,850 lb.
Mold opens (adjustable)	... 6-9 in.
Maximum die space	... 7½ in.
Minimum die space	... 3½ in.
Maximum recommended casting area in mold	... 15 sq. in.
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Heat treatment of N-alkyl polyamides.

PHOTOSENSITIVE POLYMERS. L. M. Minsk and E. M. Robertson (to Eastman Kodak). U. S. 2,670,285 -6-7, Feb. 23. Photosensitization of polymeric cinnamic acid esters.

CELLULOSE ESTERS. C. J. Malm and R. F. Williams (to Eastman Kodak). U. S. 2,670,302, Feb. 23. Cellulose esters stabilized with a glycidyl ether.

TILE. D. M. Moore and A. H. Searl (to Armstrong Cork). U. S. 2,670,307, Feb. 23. Flooring tiles containing coumarone-indene resins.

PHONOGRAPH RECORD. F. Groff and H. D. Bassett (to Carbide and Carbon). U. S. 2,670,308, Feb. 23. Polystyrene microgroove phonograph record.

RESINS. N. H. Ray (to Imperial Chemical). U. S. 2,670,333, Feb. 23. Diazoalkane condensates.

ION EXCHANGE. G. F. D'Alelio (to Koppers). U. S. 2,670,334-5, Feb. 23. Aminated aryl acetylene resins.

POLYVINYL ALCOHOL. H. H. Roth (to Dow). U. S. 2,670,336, Feb. 23. Polyhydric alcohol compositions containing an alkali salt of sulfonated alkenyl aromatic resin.

WRINKLE FILM. H. A. Toulmin, Jr. (to New Wrinkle). U. S. 2,670,337, Feb. 23. Wrinkled polyvinyl chloride-acetate films.

PLASTICS. A. M. Edmunds (to Dow). U. S. 2,670,338-9, Feb. 23. Self-hardening phenolic or furan resin compositions.

RESINS. J. D. Joffe (to Allied Chemical). U. S. 2,670,341, Feb. 23. Alcohol-modified urea resins.

POLYMERIZATION. C. B. Croston, H. M. Teeter, and J. C. Cowan (to U. S.). U. S. 2,670,361, Feb. 23. Polymerization using hydrogen fluoride as catalyst.

SHEET FORMING. G. M. Michiels (to U. S. Rubber). U. S. 2,670,501, Mar. 2. Patterned plastic sheet.

CEMENT. C. G. Elliott (to Armstrong Cork). U. S. 2,670,782, Mar. 2. Alkyd resin linoleum cement.

HINGE. A. P. Olesky (to Motorola). U. S. 2,670,872, Mar. 2. Hinge for plastic housings.

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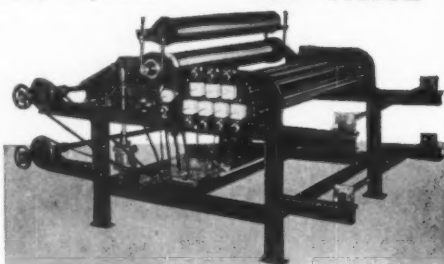
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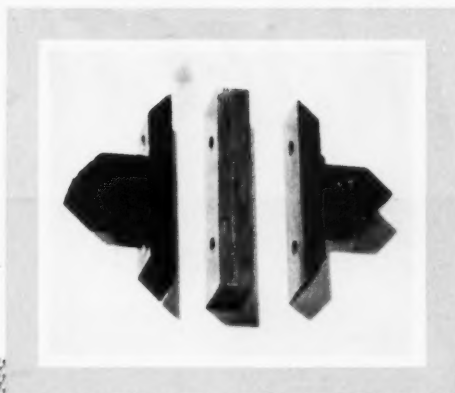
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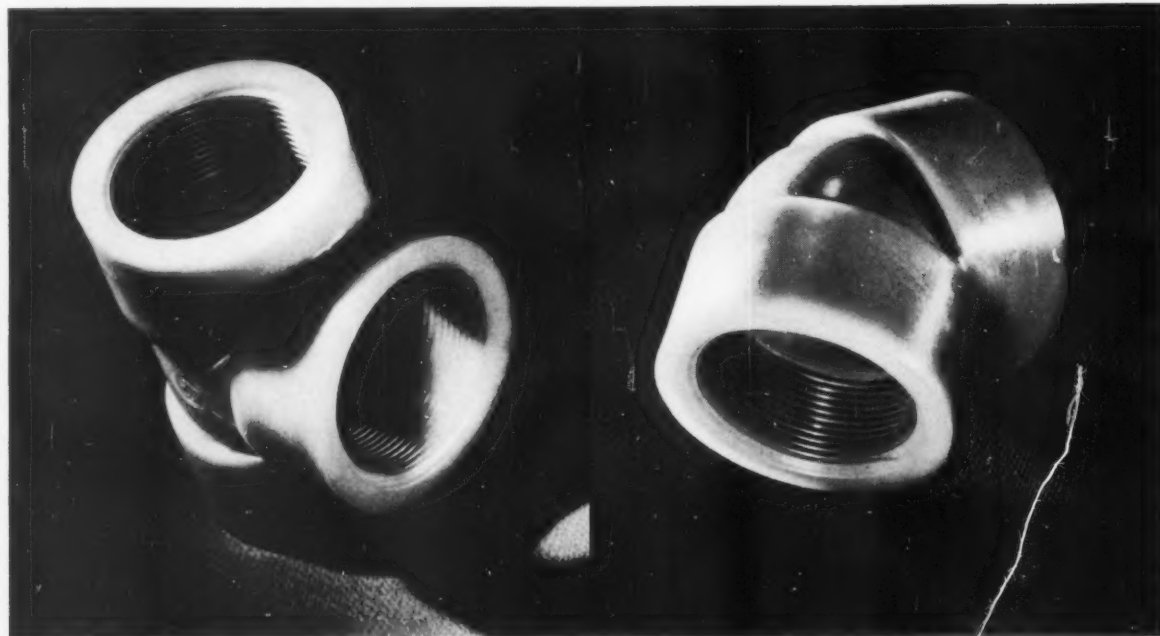
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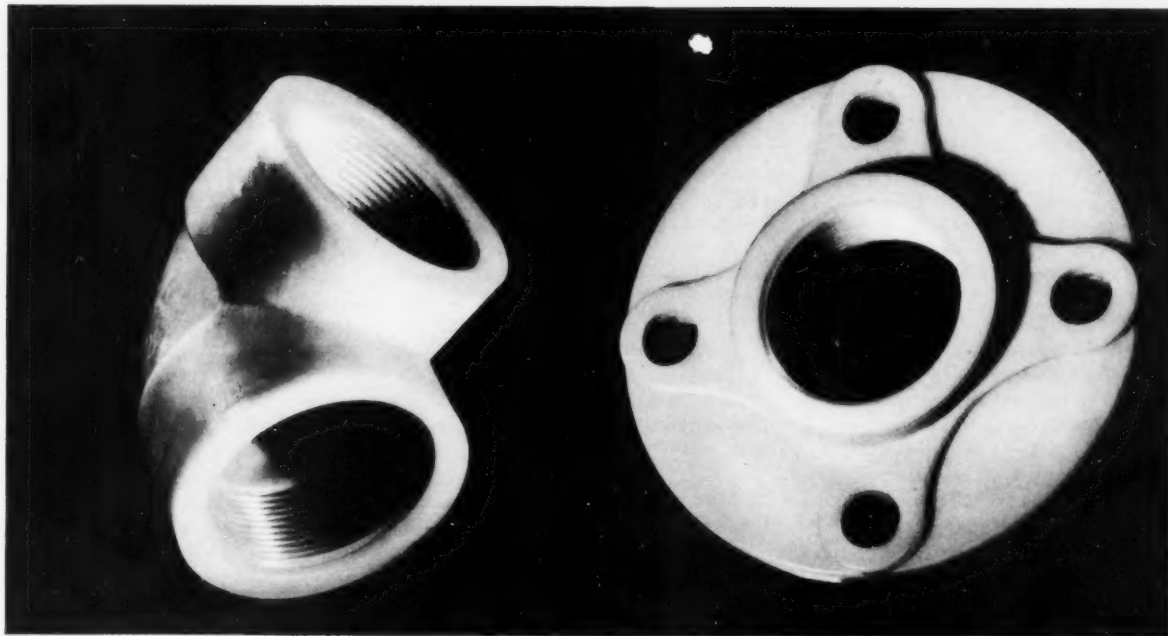
THE development of *injection molded* Unplasticized P.V.C., made from Exon 402-A is another indication of the wide versatility of this new material of construction. This achievement makes possible the manufacture of corrosion-resistant construction materials of countless sizes and shapes—produced quickly, with high strength and at low cost.

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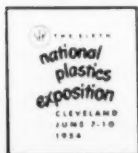
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Positive ejection of degated and fully trimmed pieces without the attention of an operator are reported as possible with a 4-oz., fully automatic injection machine developed by F. J. Stokes Machine Co., Philadelphia 20, Pa. This machine marks the entry of that company into the injection molding field.

Every step in the molding cycle is said to be automatically controlled to insure parts of identical quality. A cycle, once established, is maintained for the duration of the run, so that temperature on the material is constant, pressure is uniform, and parts identical. All operations are timed to prevent any operation from taking place until the preceding operation has been completed. In case of interruption, a Microswitch control will automatically stop the machine until the interrupting condition has been corrected. Thus, damage to molds or machine is practically eliminated.

Main cylinder and bed of the machine are cast as a single piece, making a leakproof chamber without

gaskets. A straight ram hydraulic clamping mechanism is used. Controls are simple, and pressure and control valves are panel-mounted for easy accessibility.

Ejection is positive. Hydraulically operated knockout pins remove the pieces and runners from the cavities and a mechanically actuated comb removes them from the pins automatically and trims off sprues and runners.

Automatic safety devices prevent final closing of the clamping ram in case of any malfunctioning of the machine.

Several machines may be handled by one operator, since he need do nothing else but supply material to the hoppers and remove the finished pieces.

Marking Machine—Articles whose shape requires flat-surface marking (paper or plastic covers for ice cream and food containers, refrigerator dishes, plastics novelties, etc.) can now be imprinted with descriptive data or decorative designs on the Model 25AD marking ma-

chine, developed by Markem Machine Co., Keene 42, N. H.

The unit has a multiple station dial feed which is hand-fed; it can be adapted to special feed or automatic discharge mechanisms. Operating speed is from 30 to 60 printing strokes per minute. Work holding fixtures can be modified to suit the size and shape of articles being marked. Printing area measures 11 in. left to right, 5 in. front to back.

Pyrometers—Designed for constant factory and foundry use, a recently introduced line of immersion- and surface-type pyrometers, engineered by Pyrometer Service Co., Inc., 348 River Rd., N. Arlington, N. J., has phenolic-housed meters which automatically compensate for changes in room temperature.

Four models are available: 22-B is a button-type surface pyrometer, 22-R is a roll-type for revolving surfaces, 22-H is a hypodermic type for soft materials, and 22-I is an immersion type for use with molten materials.

Model 22-B, equipped with a high-temperature Transite tip, said to be practically accidentproof, is available in 18-in. length, with adjustable tip or with an additional 4-ft. rubber flexible lead for reaching out-of-the-way places. It also has a 30-gage spring button thermocouple for instantaneous readings.

Pipe Clamp—Particularly adaptable for use on polyethylene flexible piping and larger-diameter flexible vinyl piping, a pipe clamp developed by Murray Corp., Towson, Md., is constructed of a stainless steel band, a stainless steel body, and a stainless steel worm screw. The body is attached to the band by a precision weld.

The manufacturer recommends that this clamp be used under extreme corrosive conditions in preference to its Gold Seal clamp, which has a zinc and Iridite-plated carbon steel screw.

Hydraulic System—A hydraulic system developed by M & N Hydraulic Press Co., Clifton, N. J., is designed to eliminate "in line" mounted hydraulic controls with their accompanying piping and fitting requirements. Because it has a smaller number of joints, the system



Stokes' 4-oz. automatic injection machine delivers degated and trimmed finished pieces

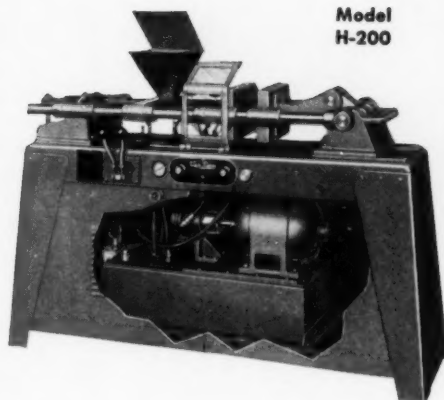
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2-oz. capacity. Van Dorn's engineering experience has scored again with this leader among all injection presses of its class. Its ultra-modern design insures faster operating cycles—up to 6 per minute. Push button controls are safe, simple and convenient. Accurate temperature regulation. Ruggedly built, compact and quiet.

Model H-200



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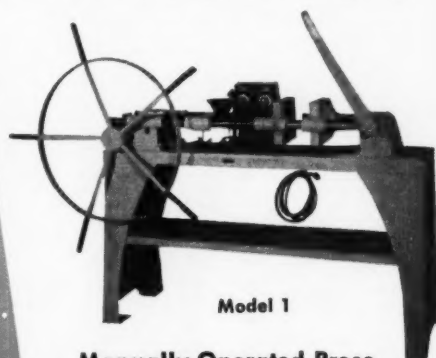
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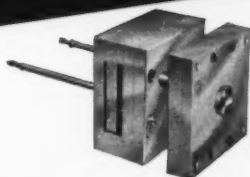
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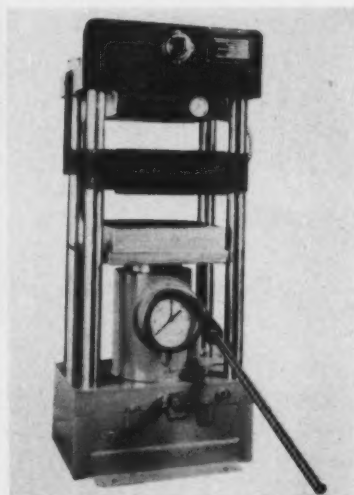
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The control system is available for hobbing, transfer molding, compression molding, and metalworking presses. Subplate-mounted hydraulic solenoid valves are also available for semi-automatic operation.

Laminating Press—Model 20 cord laminating press, manufactured by Clifton Hydraulic Press Co., 287 Allwood Rd., Clifton, N. J., is available in platen sizes of 12 by 12 in., 14 by 14 in., and 16 by 16 in., in capaci-



Clifton Hydraulic's Model 20 laminating press is available in several platen sizes, in capacities up to 50 tons

ties up to 50 tons. Upper opening is electrically heated up to 400° F., lower opening is water cooled. These presses are also made with combination platens for both heating and cooling.

Printing Machine—Color-filling and printing machine, designated Acroprinter No. 507 and produced by The Acromark Co., 561 Morrell St., Elizabeth, N. J., operates on standard factory air hose connections with 75 p.s.i. or more pressure. It is intended for light filling of de-

pressed designs and lettering on small plastics, metal, and other parts. It also prints nameplates, signal parts, ornaments, emblems, novelties, and the like at speeds ranging from 15 to 120 per min., depending on the part.

Over-all size of the machine is approximately 30 in. long by 12 in. wide, and 8 in. high.

Backstand Idler—Engineered for heavy-duty production grinding as well as for intermittent light polishing jobs which call for frequent set-up changes, "61" Universal Backstand Idler, manufactured by Coated Products Div., The Carborundum Company, Niagara Falls, N. Y., permits belts of the same length to be used with contact wheels of various diameters. A special belt tracking mechanism allows varying widths of belts, ranging from ½ to 8 in., to be used. The tracking device eliminates the need for precise center alignment between idler pulley and contact wheel, thus minimizing down time during contact wheel change-overs. A linkage-type arrangement permits manual adjustment of tension and tracking.

The "61" Universal Backstand Idler is available in two models—Model 432 for floor stand operations and Model 431 for floor, wall, or bench installation.

Reflection Gage—Designed to measure thickness of coatings on base materials, or thickness of sheets passing over a roll, Model RMB beta gage gives readings where conditions permit measurement from only one side of the sheet.

Manufactured by Industrial Nucleonics Corp., 1205 Chesapeake Ave., Columbus, Ohio, the non-contacting reflection gage finds use in measuring thickness of plastics or rubber sheet or film, as well as paper, passing over a roll, in addition to certain metal platings and paint coatings on metal.

The basic parts of the gage are a source of radiation, a radiation detector, and a recording console. The instrument works on the principle that a certain percentage of high-speed electrons emitted from a source above a base material will reflect back into the detector unit. When a coating is applied to the base material, the amount of reflected

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radiation will change. Variations in coating thickness cause variations in the amount of radiation entering the detector. These variations are measured in terms of weight per unit area or thickness.

The source of radiation and the radiation-detecting unit are enclosed in a cast metal housing which traverses the width of the sheet on steel tubes. These tubes are made to span sheets up to 160 in. in width.

The unit has an automatic standardization cycle which periodically enables the gage to compensate for error-producing variables. Additional equipment includes a continuous scanning mechanism, a weld protection unit, and a summation computer for totaling combined weights.

Calibration Instrument—Intended for checking and calibrating temperature measurement and control instruments, Series 300 portable potentiometer, produced by Wheelco Instruments Div., Barber-Colman Co., Rockford, Ill., is suitable for laboratory as well as plant or field maintenance and service work. It may be used with all commercial thermocouples.

The instrument has a 40-in. scale readable to 0.025 millivolts. Built-in thermometer facilitates measuring cold junction temperatures. The potentiometer has a special compartment for dry cells to supply power during calibration checks.

Oven—Model HBD oven is intended for preheating and stress relief of small parts, for processing nylon powders, and other processing up to 850° F. The unit, manufactured by Grieve-Hendry Co., Inc., 1811 W. Lake St., Chicago 12, Ill., consists of a cabinet (34 in. wide, 28 in. deep, and 54 in. high) and 24 drawers (2 in. high, 12 in. wide, and 26 in. deep). Construction of the unit is such that, when a drawer is pulled out, the resulting opening in the cabinet is automatically closed. This permits insertion or removal of the contents of one or more drawers without lowering the temperature in the remainder of the oven.

Tester—For determining the breaking point of gear teeth and studying the dynamic properties of parts subject to shock, an automatic, progressive, and repeat impact test-

ing machine has been introduced by Tinius Olsen Testing Machine Co., 1068 Easton Rd., Willow Grove, Pa.

In operation, a hammer of known weight is automatically raised and dropped on the test specimen from progressively higher points until the specimen breaks. Quality of material tested can be determined from height of fall at fracture and number of blows delivered.

After each blow, the hammer is picked up on the rebound by a motor-driven chain and raised to the next dropping point. Height of fall is increased by 1-in. increments for each succeeding stroke.

The unit can be adjusted to deliver an impact repeatedly from a stationary height. A specimen holder can accommodate test materials up to 24 in. in height.

Spraying Equipment—Semi-automatic painting machine, offered by Finish Engineering Co., Inc., 1115 Cherry St., Erie, Pa., is said to be capable of paint-spraying as many as 1200 pieces per hour.

To work the unit, an operator loads the part to be painted and touches a foot valve. A hold-down automatically grips the part, rotation starts, the paint gun goes on, then off, rotation stops, hold-down releases, and the cycle is repeated. To assure covering hard-to-reach places on parts with angles, corners, etc., an oscillating gun is provided, in addition to stationary gun positions.

The machine, designated Roto-Sprayer, is a complete painting unit, including booth, fan, guns, and pressure tank. It is 100% air-operated.

Filtered air carries lubricant to moving parts.

Speed of rotation, timing of paint guns, gun oscillation, and air pressure are all preset by control knobs.

Grinder—Operating on air-pressures of 50 lb. or more, and equipped with a rotor that develops a spindle speed of 100,000 r.p.m., Nu-Jett, a pencil air grinder developed by Detroit Mold Engineering Co., 6686 E. McNichols Rd., Detroit 12, Mich., is suitable for carbide burrs, abrasive mounted points, and extra-fine polishing and etching.

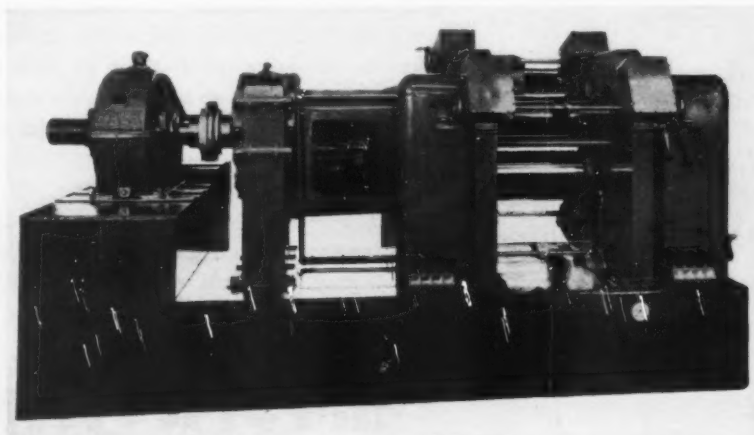
The complete packaged instrument includes air grinder, air filter, automatic lubricator, 6 ft. of flexible hose, and two chuck wrenches.

Production Tool—Magnetic thickness gage, similar to the type used for automobile tires, measures thicknesses from 0.001 to 0.015 inch. Called the Handi-Gage, it is produced by Platers Research Corp., 59 E. Fourth St., New York 3, N. Y.

When the magnetic end of the gage is applied vertically to the surface to be tested and slowly pulled away, a calibrated inner stem appears. The distance the stem travels before the magnet releases itself from the surface is a measure of the thickness of the coating.

Calender—Designed with crossed axis equipment for two of its four rolls, an inclined "Z" type calender permits laboratory evaluation of the roll-crossing feature in compensating for roll deflection.

The unit, offered by Adamson



Adamson's inclined "Z"-type calender has cross-axis equipment for two of its four rolls

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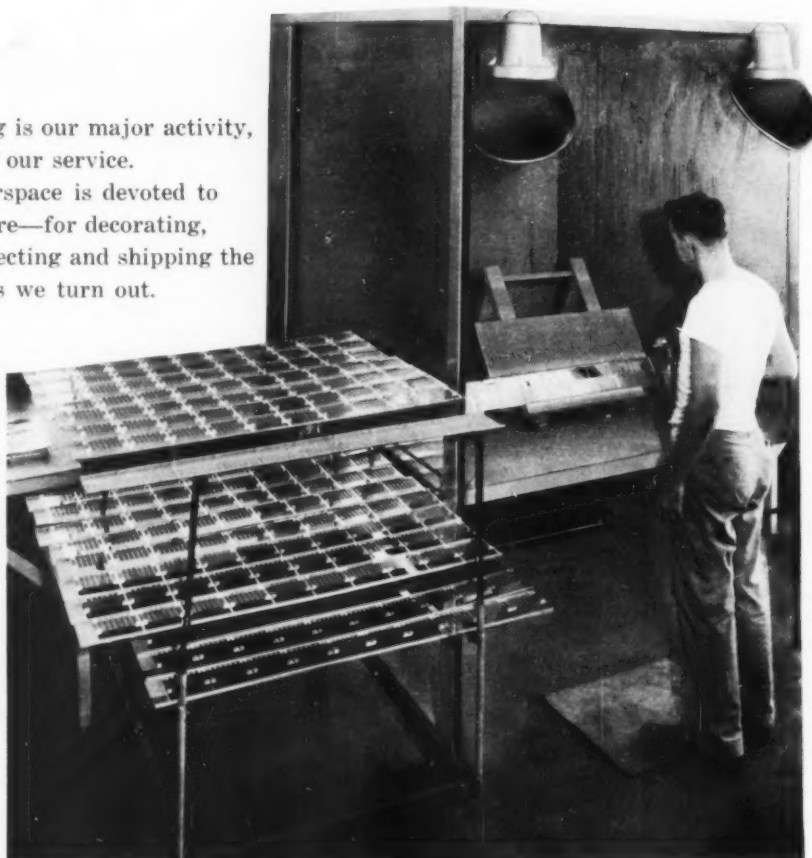
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FACT: While custom moulding is our major activity, it is merely the beginning of our service. Better than half of our floorspace is devoted to facilities like these shown here—for decorating, fabricating, assembling, inspecting and shipping the plastic units and components we turn out.

FACT: Our injection presses—which range in capacity from 8 to 375 ounces—incorporate many special production features of our own design which increase their versatility and help us mould superior products.



FACT: Numbered among our customers are some of the finest, most reputable American manufacturers. We supply them with perfect mouldings to which they are proud to affix their valued names.

FACT: WMP quality control is a fact, not a fiction. During moulding and fabrication and prior to shipment, critical inspectors check each and every piece we make.

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United Co., Akron 4, Ohio, is reported to be suitable for use with plastics, rubber, and a variety of flooring materials.

The calender is equipped with hardened forged steel rolls, manually operated adjusting screws, circulating oil lubrication system, and either sleeve or anti-friction bearings. Drive is by means of a separate pinion-gear stand, allowing rolls to be individually driven by universal joints or wobblers. Various electrical drives and drilled type rolls are available.

Grinding Wheel—Soft, flexible abrasive wheel manufactured by Merit Products, Inc., 4023 Irving Pl., Culver City, Calif., consists of hundreds of leaves of abrasive cloth sealed to a core. As the wheel spins, it presents a continuous abrasive surface to the work piece. Fanning action of the cloth strips keeps it cool. Strips wear down at uniform rate, presenting a fresh abrasive surface at all times. The strip design makes the wheel flexible and par-



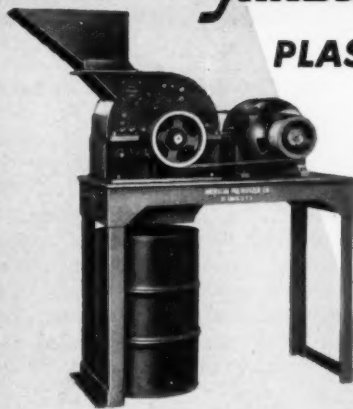
Merit Products' flexible grinding wheel is made up of hundreds of leaves of abrasive cloth sealed to a core

ticularly useful in finishing intricate shapes and recessed areas.

The unit can be attached to any rotating spindle (motor shaft, lathe, drill press, portable drill, or flexible shaft). Wheel is 1 in. wide and 6½ in. in diameter, comes in a variety of grits.

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BOOKS AND BOOKLETS

Write for these publications to the companies listed. Unless otherwise specified, they will be sent gratis to executives who request them on business stationery.

"British Plastics Year Book," 24th edition

Published in 1954 by Iliffe & Sons Ltd., Dorset House, Stamford St., London S.E. 1, England. 600 pages. Price: 30s (ca. \$4.20), plus postage.

As in the past, this yearly directory again presents a comprehensive and up-to-date classified picture of the plastics industry in the British Empire. The book is divided into nine sections. Three of them give classified lists of manufacturers and suppliers of materials, finished products, and equipment; a fourth contains an alphabetical presentation of trade and proprietary names connected with the plastics industry, together with a definition of the product involved, the manufacturer concerned, and country of origin (if not English); a name and address section covers nearly 4000 firms associated with the plastics industry, both in England and other countries, grouped alphabetically and by country; a Who's Who section gives names and positions of prominent people in Britain's plastics industry; a section on patents, 117 pages long, contains abstracts of all relevant patents issued in 1953 (British and U. S.), arranged in subject groups (amino plastics, cellulose, ethenoid resins, phenolics, polyesters, etc., and machinery); and a technical data section contains many useful tables for converting metric to British measures and vice versa, tables of melting and boiling points, specific gravities, and many others.

"Organic Peroxides," by Arthur V. Tobolsky and Robert B. Mesrobian

Published in 1954 by Interscience Publishers, Inc., 250 Fifth Ave., New York 1, N. Y. 197 pages. Price: \$5.75.

The authors investigate the role of organic peroxides in catalyzing chain reactions such as vinyl polymerization and oxidation with molecular oxygen. In the first section of this volume they present an elementary guide to the classification, structure, and synthesis of organic per-

oxides (ROOH—hydroperoxides, ROOR—dialkyl and diaralkyl peroxides, RC(=O)OOH—peroxy acids, etc.). The second section treats the physical-chemical aspects of the cleavages of the peroxide molecules, discussing decomposition of various organic peroxides. The final section investigates the role of peroxides in the initiation of homogeneous vinyl polymerizations in a detailed and quantitative manner.

"Plexiglas Craftsman's Handbook"

Published in 1954 and distributed by Thomas Y. Crowell Co., 432 Fourth Ave., New York 16, N. Y. 32 pages. Price: \$1.50.

This handbook was written primarily for the novice in acrylic craft. Eleven projects are presented, covering a large range of acrylic forming and fabricating techniques. The projects are graded from simple operations requiring a minimum of tools, materials, and skill (e.g. a triangular brooch) to advanced work of interest to those already familiar with the use of the material (e.g. a fluted bowl). The hobbyist is taken through each project in step-by-step fashion, each operation being concisely and lucidly described and illustrated with photographs. The beginner in acrylic handicraft will find this book an excellent guide.

Acrylic—The second edition of *Perspex Acrylic Materials*, a 73-page, hard-cover handbook deals in detail with standard methods of fabricating Perspex sheet and rod. Following a brief resume of the history and character of the material, the book covers such topics as machining, heat forming and shaping, shock molding, cementing and welding, dyeing, and finishing and polishing. Discussion of all these fabricating steps is accompanied by numerous photographs and diagrams. The book also contains sections on actual applications of these fabricating methods (aircraft canopies, lighting fixtures, radio

cabinets, cups, surgical instruments, etc.); on working corrugated acrylic; and on the physical and chemical properties of the material. Numerous graphs are given. *Imperial Chemical Industries Ltd., Plastics Div., Welwyn Garden City, Herts, England.*

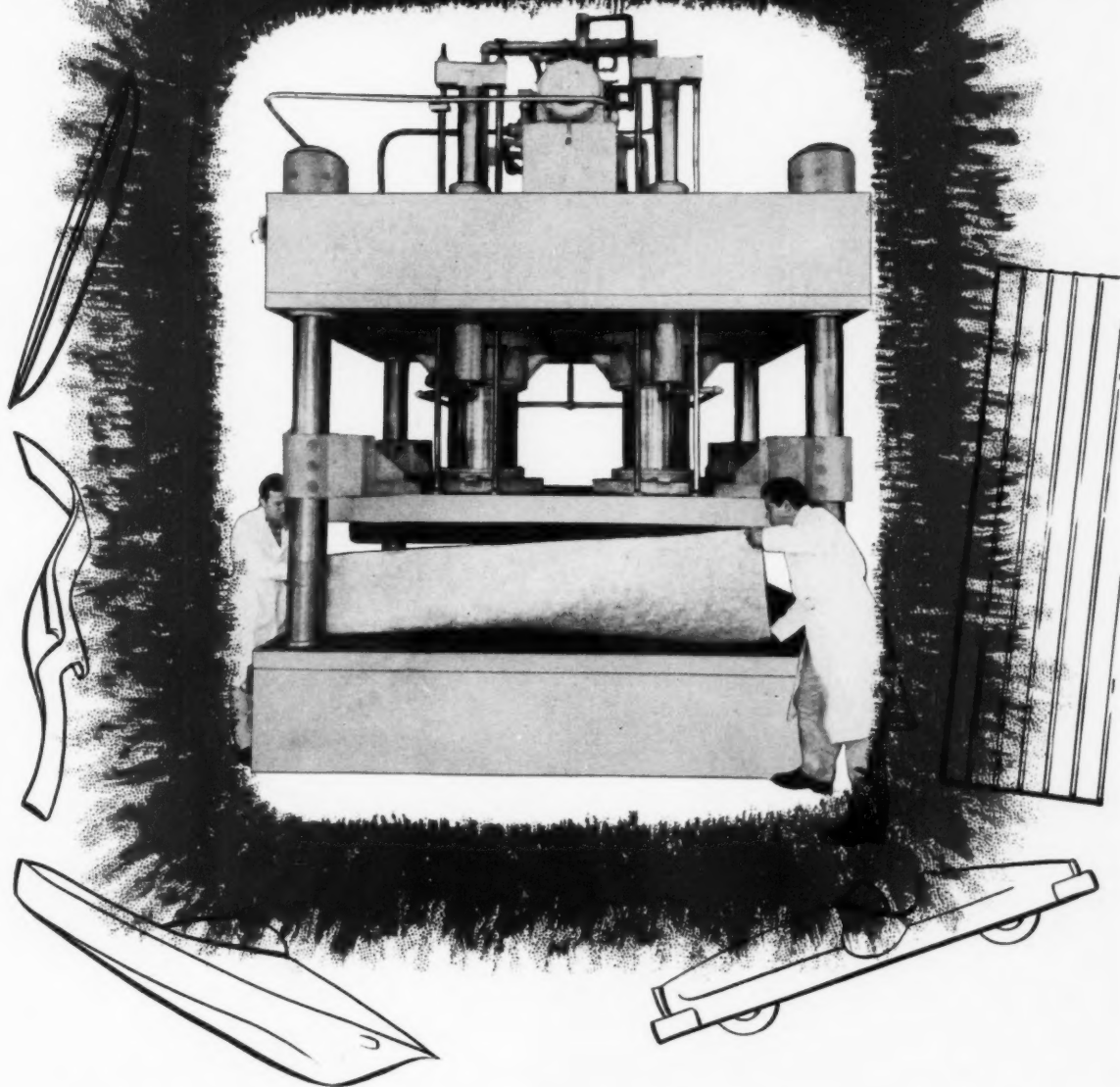
Styrene-butadiene latices—Uses and characteristics of 15 styrene-butadiene latices, offered in five different copolymer ratios, are described in this 11-page Technical Bulletin C-4-191. Discussed are characteristics of color, solids content, mechanical stability, shelf life, odor, and dilutability with water. Also listed are suggestions for use of the latices as pigment binders for clay-coated papers and clear paper coatings; in the production of grease-resistant paper and paper board; in sealer coats on felt base used in floor coverings; in textile finishing; and in rug-backing compounds. *Koppers Co., Inc., Chemical Div., Koppers Bldg., Pittsburgh 19, Pa.*

Reinforced plastics—Composition and utilization of polyester resins are the subjects of this 52-page, 5-part booklet. In the first part, a brief general description of polyesters and their present and possible future applications is given. Part II surveys the chemistry of unsaturated polyesters (history, polymerization, catalysts and promoters, etc.); applications are listed in Part III, and include casting and potting compounds and fibrous-glass reinforced plastics; Part IV deals with the equipment necessary in the preparation of polyesters and polyester varnishes and provides a variety of typical formulations; the last section consists of a bibliography of published articles dealing with the subject and a list of applicable patents. *National Aniline Div., Allied Chemical & Dye Corp., 40 Rector St., New York 6, N. Y.*

Products and services—Fields of activity of one of America's industrial colossi are strikingly described and illustrated in this hard-cover, 48-page brochure. The company is active in a widely diversified range of manufacturing and service operations. Among the former are plastics moldings, process equipment, specialized railroad tank and freight cars, welded equipment, industrial (To page 254)

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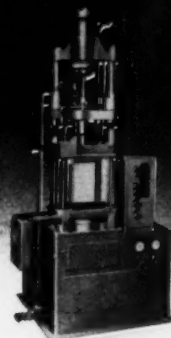
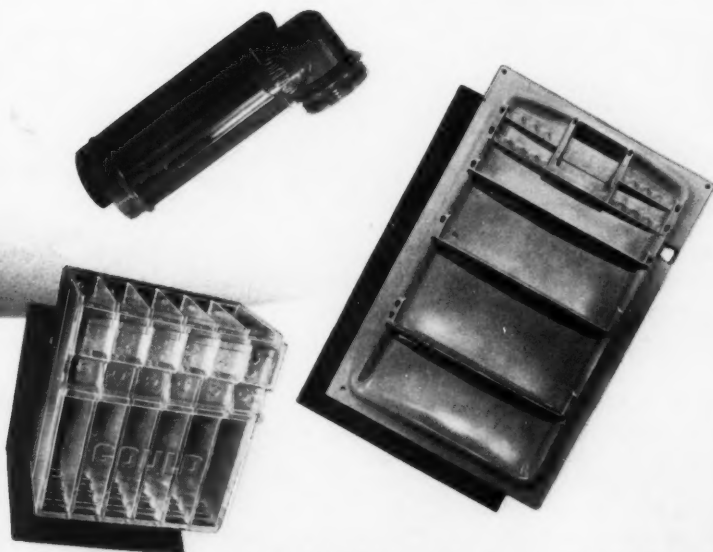
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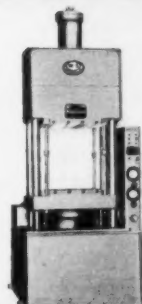
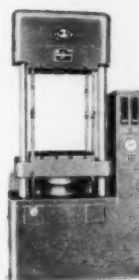
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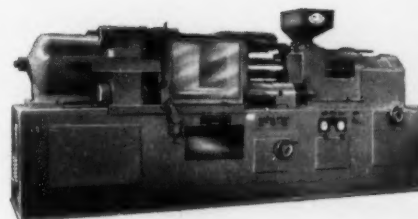
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and chemical process gas tanks, nickel plating, screw fastening devices, and others; among the latter, the firm engages in leasing out its various freight cars and tank storage facilities to numerous segments of industry. All these operations are discussed in the brochure. A section on research and development outlines the work done by the organization in that area. A list of offices and plants is also included. *General American Transportation Corp.*, 380 Madison Ave., New York 17, N. Y.

Vinyl compounds—Facilities for custom dry-blend compounding of elastomeric vinyl are described in this 4-page bulletin. Ordering information and prices are given. *Lawrence Process Co., Inc.*, 360 Merrimack St., Lawrence, Mass.

Release agent—Technical Bulletin No. 4 outlines the lubricating action of the company's polyethylene, in the processing of vinyl sheeting and film, and presents a comparison between this material and the more common release agents now used in that operation. *Semet-Solvay Petrochemical Div.*, *Allied Chemical & Dye Corp.*, 40 Rector St., New York 6, N. Y.

Products review—"New Product Bulletin, Collective Volume III," a 159-page booklet, reviews the company's literature on some of the new products test-marketed by it. The following materials are covered: acrylamide, 3-aminopropanol, N-tert-butylacrylamide, N,N-diallylmelamine, guanamines, 3,3'-aminobispropylamine, N,N'-methylenebisacrylamide, potassium diisopropyl dithiophosphate, surface active agents TR and BPE, and triallyl cyanurate. *American Cyanamid Co.*, 30 Rockefeller Plaza, New York 20, N. Y.

Patent digest—Monthly digests in English of patent applications filed with the German patent office in the rubber and plastics field give in full the translated text of the chief claim of each application, names of inventor and applicant, filing and publishing dates, and information on prior patent literature. Included is a subject index. The two digests covering the subjects are Class 39b (chemical production of plastic ma-

terials, including abrasives, friction materials, as well as thermal and acoustical insulating materials containing same) and 39c (production of synthetic resins, particularly of resinous condensates and polymers). Subscription rates are as follows: Class 39b: 6 mos.—\$60, 12 mos.—\$110; Class 39c: 6 mos.—\$45, 12 mos.—\$80; combination rates for both classes: 6 mos.—\$95, 12 mos.—\$175. *Research Information Service*, 153 Nassau St., New York 38, N. Y.

Alcohols—In the latest of its well-known "family books," the company discusses the 20 alcohols that it now sells in commercial quantities. The 52-page brochure, F-4731, lists physical properties, data on constant boiling mixtures, data on performance of alcohols in lacquers, shipping information, specifications, test methods, as well as uses and suggested applications. *Carbide and Carbon Chemicals Co.*, 30 E. 42nd St., New York 17, N. Y.

Consulting service—Services offered by this firm—consulting engineers and economists specializing in the chemical process industries—as well as a brief outline of the range of assignments undertaken and completed by it, are presented in this 16-page booklet. Among the phases of industrial activity for which it claims competence are engineering, product development, market analysis, diversification studies, licensing and sale of new processes, plant location, patent studies, and financial analysis. The staff of the organization, including degrees and background for each member, is also described. *R. S. Aries & Associates*, 270 Park Ave., New York 17, N. Y.

Colorants—Use of color in fluorine-type resins (Fluorothene, Kel-F, and Teflon) is discussed in this 4-page folder. It describes how to use colorants in fluorine-type molding powders, dispersion coatings, and extrusion coatings. Also available is 2-page Code 10153 which lists the range of available colors, the amount used to color 100 lb. of resin, and color costs for 1 lb. of plastic. *Color Div.*, *Ferro Corp.*, 4150 E. 56th St., Cleveland 5, Ohio.

Trademark—Ways in which the trademark Kreene (replacing the previously used Vinylite) can be

used in sales promotion are suggested in 4-page folder R-6. It tells how the new trademark can be employed in tag and signature, in headlines and displays, in text matter, and in conjunction with other trademarks. *Bakelite Co.*, a Div. of *Union Carbide and Carbon Corp.*, 300 Madison Ave., New York 17, N. Y.

Cellulose—Steps in the manufacture of cellulose—from the purchase of bales of cotton linters to the shipment of the finished product—are described and illustrated in this 28-page brochure, with heavy emphasis on the chemical control checks which are made at many stages of the manufacturing process. *Southern Chemical Cotton Co.*, Chattanooga 10, Tenn.

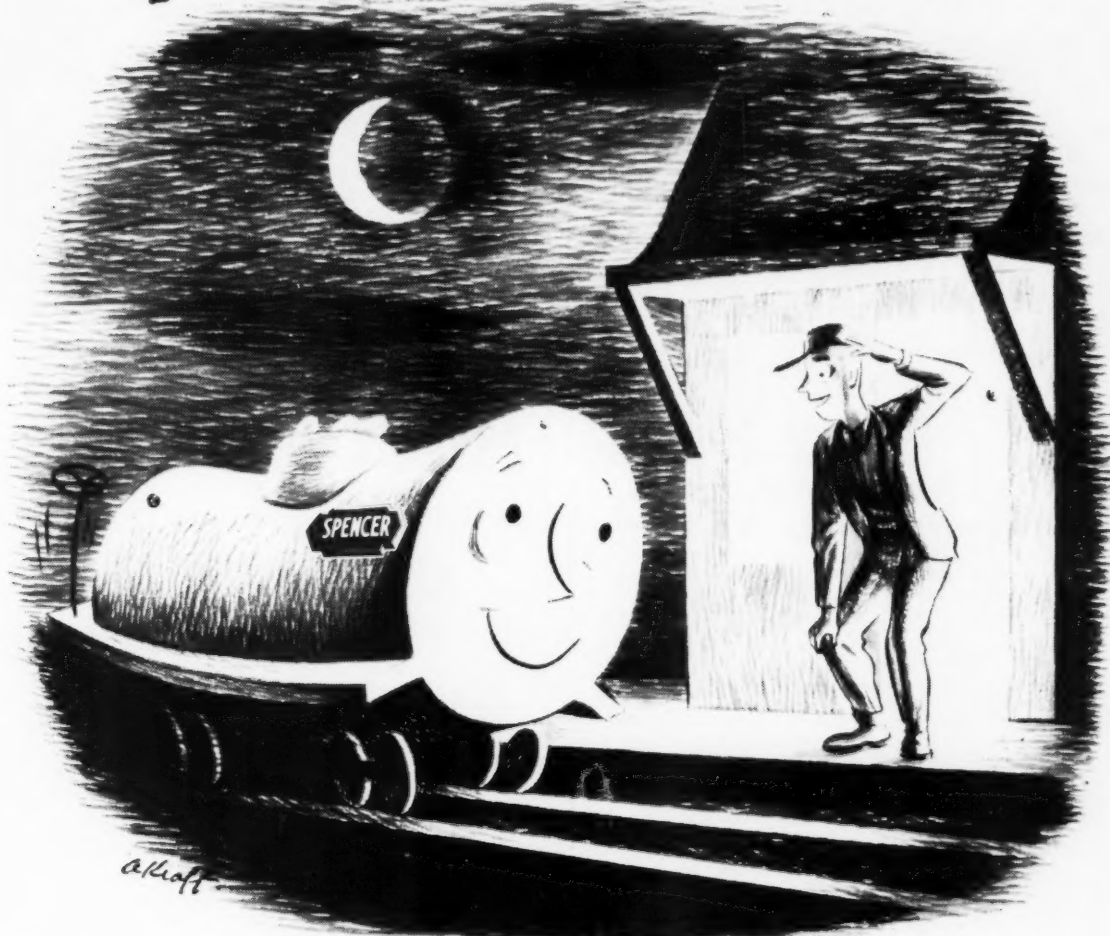
Association—Advantages of membership in one of the foremost organizations in the plastics industry are pointed up in this 12-page brochure. Benefits to be derived from membership are discussed and a brief outline of the work done by the association is presented. Six different classes of membership are available, and are described fully in the booklet. *The Society of the Plastics Industry, Inc.*, 67 W. 44th St., New York 36, N. Y.

Phthalic anhydride—Properties and uses of the company's phthalic anhydride are discussed in this 24-page booklet. Also included are sections on the chemistry of the material, methods of handling and storage, sampling and methods of analysis, and pertinent technical data. *Manufacturers' Chemical Dept.*, *American Cyanamid Co.*, 30 Rockefeller Plaza, New York 20, N. Y.

Fatty acids—A line of newly developed, structurally modified, solid fatty acids is described in Technical Bulletin 50. They are said to compare favorably in color stability with high-quality stearic acids. The booklet lists typical characteristics and properties, and discusses the effects of their behavior in finished products. *Emery Industries, Inc.*, *Carew Tower*, Cincinnati 2, Ohio.

Chemicals—"The World of Resins" is a well designed and easily read 28-page brochure describing the history and operations of one of the foremost companies in the chemical

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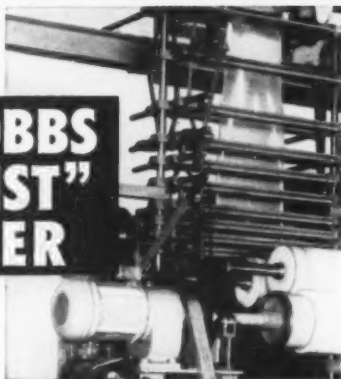
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From the start to the very finish of your rewind operation, the "Alquist" constantly and accurately maintains the desired tension—protects even the most delicate sheets of plastic from stretching, breaking or contracting. Automatically the "Alquist" senses the increase in torque as the roll diameter builds up and it slows down the speed of the shaft in direct proportion. Constant tension can be maintained in a roll build-up of as high as 10 to 1.

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Power utilization of the "Alquist" is as high as 80%, approximately four times greater than other types of winders. This means important savings in energy. Maintenance is as slight as with any normal A. C. motor—there are no brushes or tubes to contend with. The "Alquist" is compact, saves you floor space. It is clean, there are no belts to slip and stir up dirt. It is flexible—connect it directly to the rewind shaft, or remotely by chain and sprockets. And it needs no supervision, saves you labor costs.

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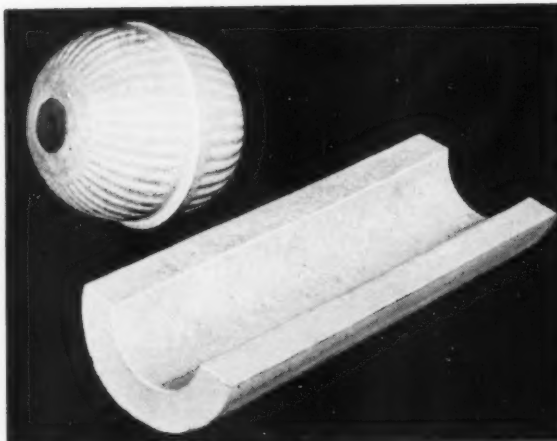


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- 5.—CUSTOM EXTRUSION. S & F maintains complete facilities for the quality production of custom extruded shapes to your specifications.

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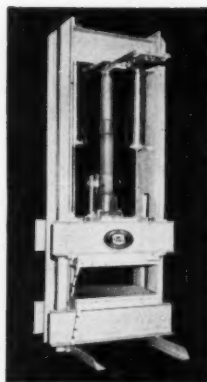
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U.S.A.

and resin manufacturing field. It takes the reader on a "tour of the plants," describing the operations of its U. S. units and those of many of its foreign affiliates. It also outlines the various end uses into which its products go. *Reichhold Chemicals, Inc.*, 525 N. Broadway, White Plains, N. Y.

Infra-red radiation—High-speed drying and curing of synthetic textile finishes by means of far infra-red radiation is covered in a 22-page illustrated folder entitled "The Textile Report." The equipment required for these operations is adaptable to existing tenter or pin frames. The system cures and dries up to 60 yd./min., producing uniform cure on materials ranging up to 1½ yd./lb., web widths to 216 in., and curing temperatures up to 300° F. *Edwin L. Wiegand Co.*, 7503 Thomas Blvd., Pittsburgh 8, Pa.

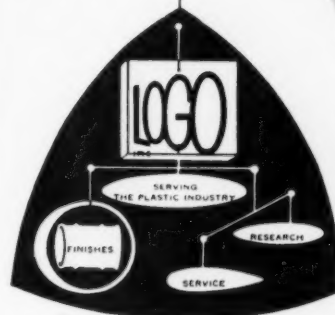
Reference book—The second part of "Dechema-Werkstoff Tabelle," third edition, has now been issued as a special number of the "Dechema-Erfahrungsaustausch." This standard reference book records the be-

havior of some 100 constructional materials used in chemical engineering in the presence of nearly a thousand chemical agents. Each single sheet contains particulars of the behavior of 100 materials when subjected to the action of one chemical agent and records special experiences and results gained in practice with the various materials. There are 100 sheets in the second part. 30 DM (ca. \$8.00) in American currency. *Dechema, Deutsche Gesellschaft für chemisches Apparatewesen, Frankfurt am Main, Postfach, Germany.*

Vibrating conveyor—Use of the Oscilveyor, a vibrating conveyor for handling fine granular materials, is explained in this bulletin. Also included are performance data, dimensioned engineering drawings, and tabular information correlating pan size with the speed at which the material travels. *Gifford-Wood Co.*, Hudson. N. Y.

Polyethylene ware—A line of laboratory containers and equipment made of polyethylene is described in this catalog. Among the items

new emblem of service to you*



* Now it's a new trademark. Our customers, designers and the trade have learned to expect Logo to develop the "new" in finishes for plastics. It seemed logical, therefore, to develop also a new symbol of our many services to the plastic industry.

ALSO NEW—"A Policy of Service" booklet describes our six basic services available to the plastic industry. Write for it, won't you?

LOGO, INC.

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CHICAGO 33, ILLINOIS

a subsidiary of
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listed are hydrometer jars, pipette jars, weighing bottles, pour-out spouts, gallon jugs with handles, hand-operated pumps, and others. The equipment may be used with hydrofluoric acid, mercury, hydrogen peroxide, detergents, and other laboratory chemicals. *Schaar & Co.*, 751 W. Lexington St., Chicago 7, Ill.

Oil diffusion pumps—Data sheet 6-55 contains physical dimensions, operating data, and performance curves for a line of high-vacuum oil diffusion pumps. The smallest of the eight fractionating metal pumps in this series has a 2-in. diameter and a peak speed of 19,000 liters a second. These pumps will produce an ultimate pressure of 5×10^{-7} mm. Hg at 25° C. *Consolidated Vacuum Corporation*, Rochester 3, N. Y.

Motor valves—Diaphragm motor valves with double-seated, single-seated, low-flow, Venturi, and three-way bodies are described and illustrated in Catalog 800. The 36-page booklet gives specifications, mounting dimensions, and design and construction details of the Series 800 valves. Optional accessories are



How Flexible uncorked a **BOTTLENECK** in a production jam-up

It all began a few months ago when one of our clients came to us with a serious production problem. His operation was clogged-up; orders were overdue; he needed help — fast!

At the time he was shopping out the production of his very smart leak-proof plastic cosmetic case. He was cutting the pieces himself, someone else was heat-sealing, and a third party was doing the silk-screening. The portal to portal time lapse was cutting deeply into profits, and the quality of the product was on the shaky side.

As we're able to take over production, if need be, to keep a client on schedule, we did! Today the client's profits are where they should be, and all orders go out on time.

Do you have a problem? Write, wire, or call, and we'll come quick!

EXPANDING? Come South. Living conditions superb. Power, labor, plant sites plentiful. Too, our services are right next door by train or plane.



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Products

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Plastisols • Organosols • Latex • Slush
Molding and Dipping of Plastisols and Latex
• Custom Silk Screening and Heat-Sealing
of Vinyl Film • Southern Reps. for Harte
& Co., Mfgs. of "Watasal" Film & Sheeting

also shown. Minneapolis-Honeywell Regulator Co., Industrial Div., Station 64, Wayne and Windrim Aves., Philadelphia, Pa.

Products and services—Activities of the various units of the parent company are outlined in this portfolio. These activities include: manufacture of laminated resin impregnated fibrous glass, lightweight sandwich paneling; design and manufacture of tubular fibrous glass-reinforced plastics products; manufacture of adhesives and low-pressure laminating resins; and product research. Narmco Inc., 600 Victoria St., Costa Mesa, Calif.

Water treatment—Use of the ion exchange process in the softening, dealkalization, and de-ionization of water for industrial processes is described in detail in this booklet entitled "If You Use Water." The chemical processes taking place during ion-exchange water treatment are discussed, and advantages of the various treatment methods are interpreted in terms of applications in specific industries. *The Resinous Products Div., Rohm & Haas Co., Washington Sq., Philadelphia 5, Pa.*

Plastic metal—Material for use in making drill fixtures and jigs, holding devices, forming dies, and models, described in this four-page folder, consists of a combination of fine steel powder and an unnamed plastic. In its original state it has the consistency of and can be worked like modeling clay; after 2-hr. hardening time (without application of heat or pressure), however, it hardens into a strong metallic solid that will not shrink. Shelf life is reported to be 12 months under normal conditions. *Chemical Development Corp., Danvers, Mass.*

Consumer and industrial safety—Activities of one of America's chemical giants in determining whether new chemicals may be safely introduced commercially or old ones safely put to new uses, and in finding answers to problems of safety and health in the design and operation of plants and equipment, manufacture of chemical containers, and similar problems, are presented in Life-style picture-and-caption fashion in this 32-page brochure "Protecting the Public Health." The

scope of the company's efforts in this field is indicated by the fact that it employs a staff of 166 doctors, 274 nurses, and 102 scientists and technicians in this field alone. The various techniques used in testing product and equipment, make fascinating reading. *E. I. du Pont de Nemours & Co. (Inc.), Wilmington 98, Del.*

Plastics pipe—Preliminary data on a series of tests conducted on plastics pipe (butyrate, polyethylene, vinyl, and modified styrene) in cold-water systems from the standpoint of sanitation are contained in "Report for 1953." Other activities by the sponsoring organization in the field of sanitation are also reviewed. The report includes a list of publications which have been issued by the organization. *National Sanitation Foundation, School of Public Health, University of Michigan, Ann Arbor, Mich.*

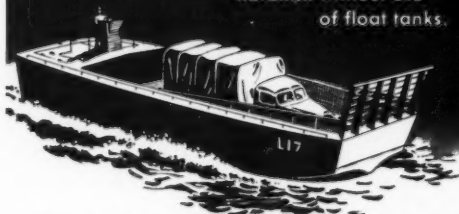
Extrusion—Facilities for the design, development, and production of plastics extrusion offered by the company are listed in this 20-page brochure. It discusses the advantages of rigid plastics extrusions, presents several case histories of new applications which were developed by the firm, and includes diagrams of numerous standard and unusual stock sections. Ordering information, with special regard to custom extrusion for specific product applications, is included. *Sheffield Plastics, Inc., Sheffield, Mass.*

Adhesive—Range of adhesives for use with Mylar polyester film is outlined in this leaflet. Included are adhesives for bonding Mylar film to paper, to aluminum foil, to steel, to vinyl, and to polyethylene. Data on color stability, heat resistance, and resistance to outdoor weathering are presented. *Rubber and Asbestos Corp., 225 Belleville Ave., Bloomfield, N. J.*

Test equipment—Universal testing machines of 20,000- and 60,000-lb. capacity are described in 4-page Bulletin 4213. Principles of a hydraulic straining system and null method load indicators are given along with descriptions of accessories and specifications. *Baldwin-Lima-Hamilton Corp., Philadelphia 42, Pa.*

*Here's what happens
when you marry*
**DOUGLAS AIRCOMB and
FIBRE-GLASS LAMINATES**

CROSS-SECTION of
boat hull, showing how
Aircomb is used as filler
between fibre-glass laminates to
provide strength, rigidity and exceptional
flotation without use
of float tanks.



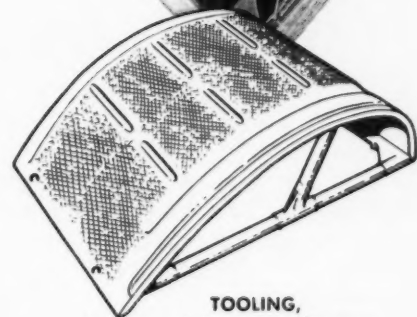
Plastic manufacturers are discovering that Douglas Aircomb in fibre-glass and other laminates gives greater strength with lighter weight than ever before obtainable —

in boats ... where Aircomb incorporated in the fibre-glass hull structure provides both rigidity that makes a stiff boat without bulkheading, and a flotation factor which takes the place of air tanks and thus increases space available for cargo or gear.

in tooling ... where metal bracing strips can be eliminated because Aircomb between fibre-glass has the required stiffness, and is lighter.

in parts manufacture ... for aircraft and many other applications where fibre-glass with Aircomb can be held to close tolerances, and formed in a variety of complex shapes with a great saving in weight and no penalty in strength.

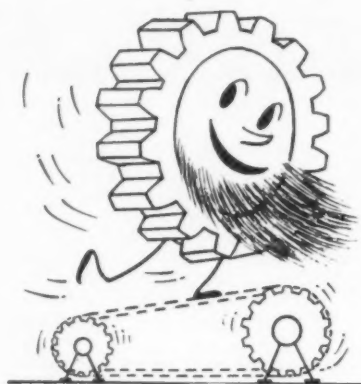
Engineering and design assistance is available from the Douglas Aircomb division for fibre-glass applications in your product.



TOOLING,
especially of large fixtures,
can be accomplished with Aircomb
between fibre-glass for required
stiffness with lighter weight.

AIRCOMB TRADE MARK 

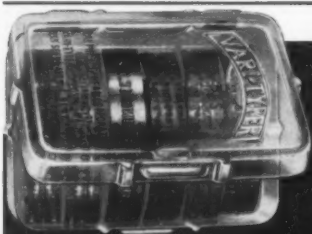
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*Need a gear
that wears longer?*

**YOU NEED
DuPont ZYTEL**
TRADE MARK

See pages 10 - 11



**LOW DIE
COST ON
CUSTOM
BOXES**

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PLASTIC BOXES

A quality box made to be used by
industry... not a light packaging box

- Very tough — will not crack or shatter in normal use.
- Stainless steel hinges.
- Resistant to most chemicals — samples supplied for tests.
- May be beautifully heat embossed.
- All transparent or color combinations.
- Make your own compartment layout on our PLOT PLAN sheets.
- State your problem — let us solve it.

Full information and Plot Plan Sheets sent upon request...Dept. M-1

SHOE FORM CO. INC.
AUBURN, NEW YORK



Production of

FOR the purpose of this report, production is the sum of the quantities of materials produced for consumption in the producing plant, for transfer to other plants

PLASTICS AND SYNTHETIC RESIN PRODUCTION From Statistics Compiled

Materials

CELLULOSE PLASTICS:^a

Cellulose acetate and mixed ester:
Sheets, under 0.003 gage
Sheets, 0.003 gage and over
All other sheets, rods, and tubes
Molding and extrusion materials
Nitrocellulose sheets, rods, and tubes
Other cellulose plastics

PHENOLIC AND OTHER TAR-ACID RESINS:

Molding materials^a
Bonding and adhesive resins for—
Laminating (except plywood)
Coated and bonded abrasives
Friction materials (brake linings, clutch facings, and similar materials)
Thermal insulation (fiber glass, rock wool)
Plywood
All other bonding and adhesive uses
Protective-coating resins, unmodified and modified except by rosin
Resins for all other uses

UREA AND MELAMINE RESINS:

Textile-treating and textile-coating resins
Paper-treating and paper-coating resins
Bonding and adhesive resins for—
Plywood
All other bonding and adhesive uses, including laminating
Protective-coating resins, straight and modified
Resins for all other uses, including molding

STYRENE RESINS:

Molding materials^a
Protective-coating resins, straight and modified
Resins for all other uses

VINYL AND VINYL COPOLYMER RESINS, total^b

Polyvinyl chloride and copolymer resins
(50 percent or more polyvinyl chloride) for—
Film (resin content)
Sheeting (resin content)
Molding and extrusion (resin content)
Textile and paper treating and coating (resin content)^c
Flooring (resin content)
Protective coatings (resin content)
All other uses (resin content)
All other vinyl resins for—
Adhesives (resin content)
All other uses (resin content)

COUMARONE-INDENE AND PETROLEUM POLYMER RESINS

MISCELLANEOUS SYNTHETIC PLASTICS AND RESIN MATERIALS:

Molding materials^{a, d}
Protective-coating resins^e
Resins for all other uses^f

^a Dry basis is designated unless otherwise specified.

^b Partially estimated.

^c Includes fillers, plasticizers, and extenders. ^d Production statistics by uses are not representative, as end use may not be known at the time of manufacture. Therefore, only statistics on total production are given. ^e Includes

Plastics Materials

of the same company, and for sale. Sales include only the quantities involved in bona fide sales in which title passes to the purchaser.

IN POUNDS* FOR JANUARY AND FEBRUARY 1954
by U. S. Tariff Commission

January**		February**	
Production	Sales	Production	Sales
1,453,336	1,310,025	1,336,179	1,168,089
838,564	750,273	1,071,029	794,239
455,559	434,583	408,750	388,157
5,367,375	5,682,274	5,167,946	5,064,816
562,662	523,853	597,795	459,867
412,462	456,863	486,387	435,027
15,232,036	14,654,740	16,086,744	14,232,330
4,981,926	3,283,044	5,520,162	3,159,799
829,939	888,634	688,510	806,790
1,373,356	1,241,822	984,034	1,035,709
2,296,636	2,531,499	2,060,422	2,146,369
2,468,147	2,415,189	2,729,902	2,726,631
1,712,441	1,755,082	1,111,768	1,052,067
1,797,481	1,881,828	1,740,455	1,683,985
1,947,362	1,373,239	1,578,851	1,517,831
2,849,432	1,544,234	3,090,619	2,228,140
1,750,912	1,588,999	1,643,422	1,454,155
5,150,160	4,397,845	6,443,605	5,009,496
1,876,367	2,157,028	2,325,516	1,604,446
2,103,669	1,585,701	2,066,368	1,403,799
6,019,551	4,890,874	5,644,743	4,907,215
23,633,302	24,770,378	26,011,308	23,857,095
6,675,547	6,534,260	6,184,533	6,070,711
7,307,367	7,308,475	7,364,287	6,589,127
40,636,166	37,130,905	39,809,528	40,102,550
	4,868,972		5,169,694
	5,435,105		5,720,128
	10,120,169		10,710,550
	4,637,739		4,346,100
	910,648		1,170,418
	1,614,062		1,829,210
	1,730,594		2,407,098
	1,825,552		2,037,626
	5,988,064		6,711,726
14,333,495	14,982,662	17,471,734	15,824,741
15,826,383	13,815,403	15,578,696	12,887,000
338,771	343,197	689,089	309,419
8,708,964	9,415,643	9,555,492	9,426,779

data for spreader and calendering-type resins. * Includes data for acrylic, polyethylene, nylon, and other molding materials. * Includes data for epichlorohydrin, acrylic, polyester, silicone, and other protective coating resins. † Includes data for acrylic, rosin modifications, nylon, silicone, and other plastics and resins for miscellaneous uses.

COTTON FABRICS

FOR
COATING
AND
LAMINATING

★
J.H. LANE & CO., Inc.

250 W. 57th St. • New York, N. Y.

Simplify Your Maintenance Problems ROTHERM REVOLVING JOINTS

Air • Steam • Hydraulic

High and Low Temperatures
300 POUNDS STEAM PRESSURE



- SEVEN DIFFERENT STYLES
- SIZES 1/2" to 5" INC.
- SHIPMENT FROM STOCK

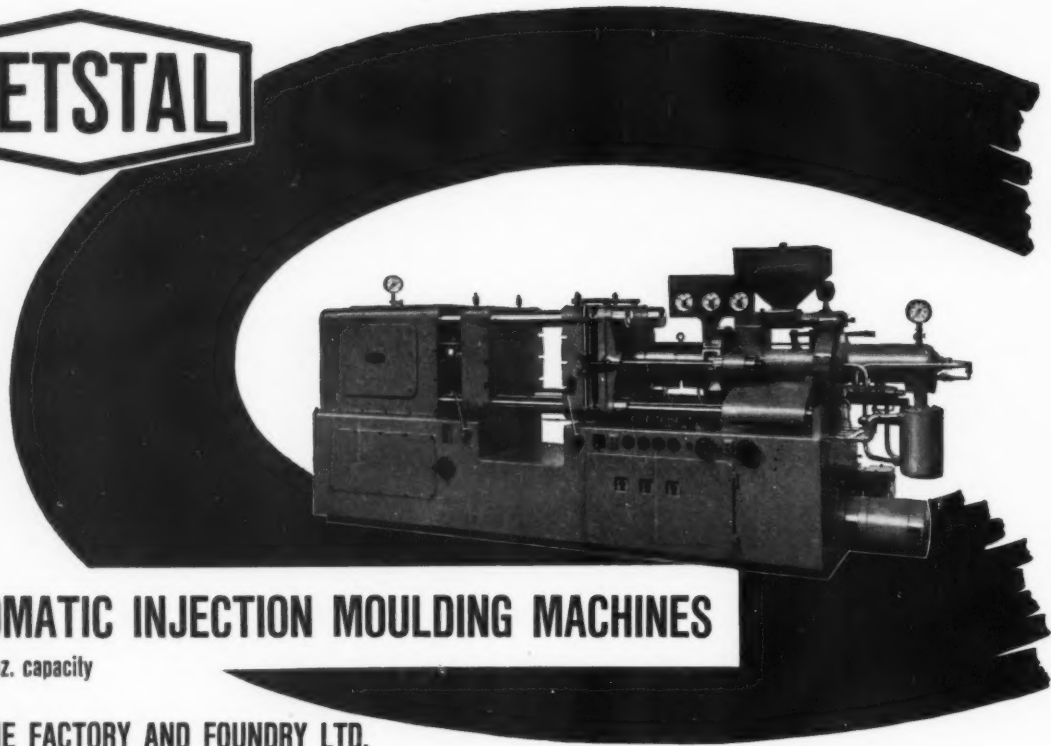
1. Lowest Turning Torque
2. Smallest Overall Dimensions
3. Carbon Seals Cannot Break
4. TEFLON Stationary Seal
5. Compensates For Roll Eccentricity
6. Syphon Pipe Will Not Weave Or Break
7. No Bearings
8. No Lubrication
9. No Flexible Hose (Optional)
10. Can Be Easily Repaired (Only Seven Parts)

MANY INSTALLATIONS NOW IN PLASTIC PLANTS

ROTHERM ENGINEERING COMPANY INC.

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AUTOMATIC INJECTION MOULDING MACHINES

up to 10 oz. capacity

MACHINE FACTORY AND FOUNDRY LTD.
NETSTAL / Switzerland

Agents wanted for U.S.A.



*Make a
Note . . .*

Look closely at any one of the thousands of Handee-Pads we're injection-molding for D'Art Craftsman, Inc., of New York. You'll see why folks like D'Art keep calling on us to make the products they're going to sell.

We believe it's a fussy insistence on perfection in appearance and performance—a pride in workmanship above and beyond the contract terms—that gives the products we produce a selling edge in stiff competition.

Doesn't your new product deserve every break? Make a note to Call on Connecticut for consistent quality, at low unit cost.

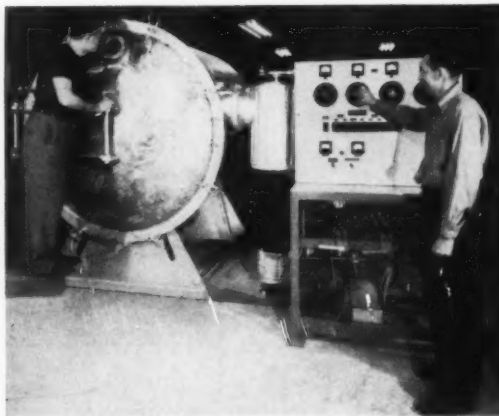
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70 West Liberty Street

Waterbury, Connecticut

▼ P-6 METALLIZER

An industrial metallizer capable of handling any vacuum metallizing job. Available in a large range of sizes for laboratory and industrial use.



Call or write for literature giving complete details.

OPTICAL FILM ENGINEERING CO.

2731-2737 North Sixth Street
Philadelphia 33, Pennsylvania
Telephone: GARfield 3-9008

Canadian S.P.I.

AT the 12th Annual Conference of Society of the Plastics Industry (Canada), Inc., on April 5 and 6, G. Murray Scott, Dow Chemical of Canada, Ltd., was re-elected president for the ensuing year. Also re-elected were A. E. Byrne, Canadian General Electric Co. Ltd., as vice president; R. T. Todd, Irvington Varnish and Insulator Co. of Canada, Ltd., as treasurer; and F. G. Rice, Canadian Industries, Ltd., as councilor at large.

Speakers at the conference included R. B. MacPherson, Canadian Industries, Ltd., who gave a comprehensive report on Canada's trade position, pointing out that the Canadian economy was woven into that of the United States. Mr. MacPherson also noted that because of an abundance of raw materials and a growing population, Canadian businessmen can look forward to a bright future.

D. C. R. Miller, Dow Corning Silicons, Ltd., discussed the properties and the future possibilities of silicone resins. J. E. Carey, Shell Chemical Corp., offered a similar discussion on epoxy resins.

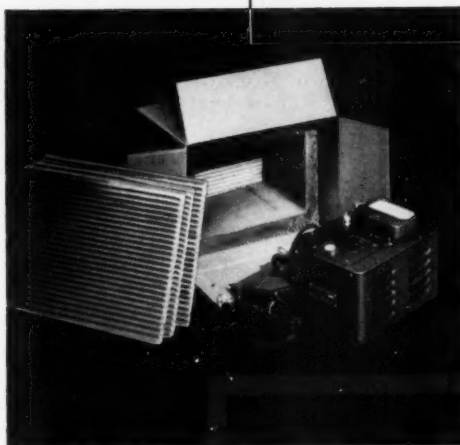
A luncheon session featured a speech of welcome to the assembled delegates by Mayor Camellien Houde of Montreal.

"How to Secure Industrial Peace Through the Labor Contract," was the subject of a talk delivered by Benjamin Werne, S.P.I.'s labor relations consultant.

Other speakers and their subjects were A. Herman Cole, Canadian Car and Foundry Co. Ltd., "A Safety Program for the Small Industrial Plant"; J. Johnson, Chicago Molded Products, Inc., "Large Plastics Moldings"; D. Wilson, Polyrein Corp., "Fantastic Plastic—the Story of Polyesters"; and Joseph L. Sholkin, Beacon Plastics Corp., "Informative Labeling."

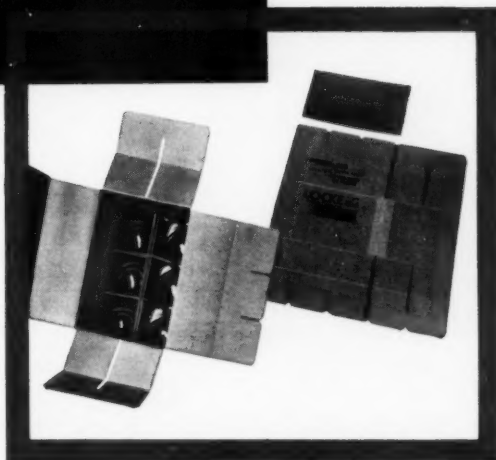
Another talk was delivered by Donald W. Buchanan, secretary of the National Industrial Design Council, who explained how this organization aids Canadian industry.

The Achievement Awards made by *Canadian Plastics* magazine for developing outstanding or unusual plastics applications were presented to 24 companies at a luncheon session.



SLICE
product
damage

SLASH
packing
time



Write for free booklet,
"How To Ship More Economically
in Corrugated Boxes."
Hinde & Dauch, Sandusky 13, Ohio

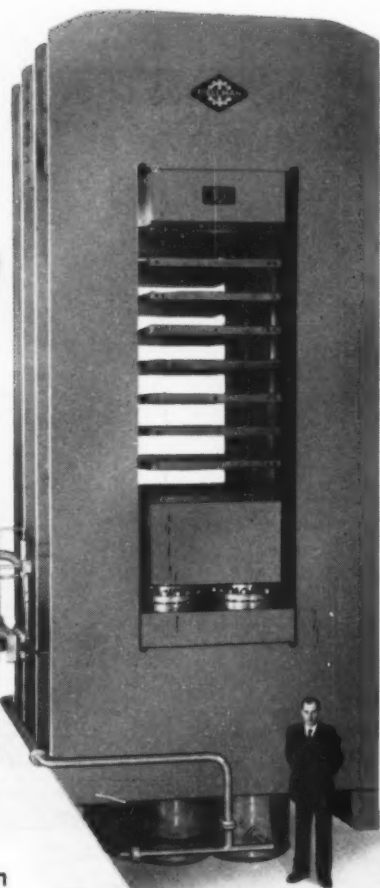
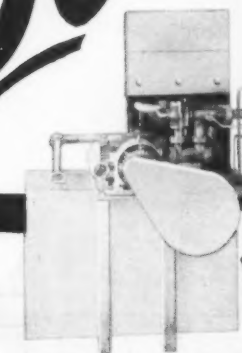
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40 SALES OFFICES • 17 MILLS AND FACTORIES

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Fjellman and Winther Company can offer you
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or installed in your present press.



Why not investigate now!

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Joliet, Illinois
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Pacific Coast S.P.I.

THE 11th Annual Pacific Coast Section Conference of Society of the Plastics Industry was held on March 10 to 12 in Coronado, Calif.

New officers elected at the Conference were: *West Coast* — Barton H. Thompson, Dura-Flex Co., chairman; K. R. Mergen, Crest Molded Products, Inc., vice chairman; E. N. Huling, Wilcox Plastics, Inc., secretary; W. R. Kidder, Eastman Chemical Products, treasurer. *Southern California* — Linn Rodgers, Lee Deane Products, Inc., president; A. C. Young, Barrett Div., vice president; W. Brandt Goldsworthy, Industrial Plastics Corp., secretary; James H. Watt, Monsanto Chemical Co., treasurer. *Northern California* — John L. Stief, Coast Mfg. & Supply Co., president; W. D. Love, American Molding Co., vice president; Donald E. Fritts, Plastic Center Co., Inc., secretary; Kenneth M. Holland, California Reinforced Plastics Co., treasurer.

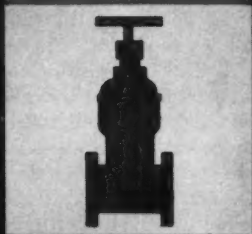
A forum on the marketing, merchandising, and selling of plastics was conducted by a panel consisting of Ralph F. Hanson, Edmund D. Kennedy, and D. Guarnaccia, all of Monsanto Chemical Co.

Other speakers in the Molders' Management and Engineering Sessions of the Conference were: E. L. Kropscott, The Dow Chemical Co.; A. R. Morse, Molders Service Co.; L. S. Krieger, Krieger Color and Chemical Co., Inc.; George Jargstorff, Bakelite Co.; Dr. L. P. Moore, American Cyanamid Co.; Herman Miller, Miller Brothers; Byron Belden, Baldwin-Lima-Hamilton.

Various phases of the reinforced plastics industry were covered by John G. Coffin, Chevrolet Div., General Motors Corp.; Norry Hastings, Rezolin, Inc.; Dr. D. W. Elam, Shell Chemical Co.; J. S. Finger, Corrolux Div., Libbey-Owens-Ford Glass Co.; and George H. Hicks, Reichhold Chemicals, Inc.

The relationship between the military, prime contractor, processor, and material supplier in the aircraft industry was discussed by such speakers as Clinton C. Booth, Flek Corp.; George Papen, Lockheed Aircraft Corp.; J. A. Kramer, Plastic Age Co.; David S. Siteman, Olympic Plastics Co.; and John Delmonte, Furane Plastics Co.

For Rigids



For Floorings

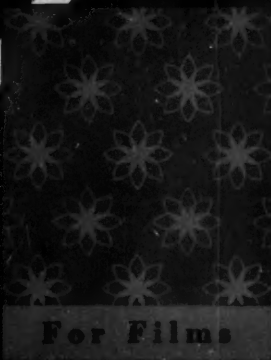


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PROMPT DELIVERY FROM STOCK
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BROSITES OVENS and DRYERS

• SIMPLE AND FAST TO OPERATE



MODEL NO. 1

Single Door: Width 24½"
Five trays 15" x 22"
x 2½"
Height 50"—Depth 28½"
Heating Element 1800
watts.
Thermostatic Control
100° to 300° F.



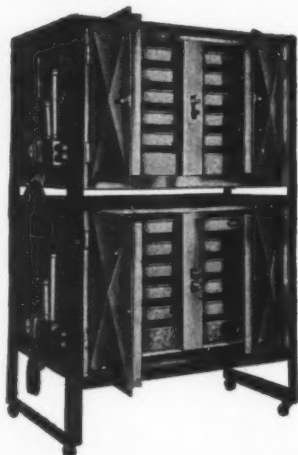
MODEL NO. 2

Double Door: Width 48"
Height 50"—Depth 28½"
Ten trays 15" x 22"
x 2½"
Heating Element 3600
watts.
Thermostatic Control
100° to 300° F.

MODEL NO. 3

Double Decker:
Width 48"
Height 68½"—
Depth 28½"
Twenty Trays 15" x
22" x 2½"

Model No. 3 is two
Model 2 units placed
one above the other.
They can be operated
independently of
each other and the
top unit can be used
in reverse position
whenever desired.



built of steel sheeting, carefully and thoroughly insulated with rock-wool insulation placed between the inside and outside shells of the dryer. Mounted on casters for easy movement from one location to another in the plant. Each unit is equipped with thermostat to automatically control temperature of the oven. A light indicates when unit is in operation.

**RUGGED, made to
last . . . EFFICIENT,
economical to use**

The trays are of such
size and design to
hold approximately 10
pounds of the average
material when placed
to a depth of about
one inch. Special trays
of expanded metal
allowing greater circulation of heat can be
supplied and are recommended for the
pre-heating of pellets and
other solid objects. For
special uses the trays,
or the entire unit if
required, can be made
of stainless steel,
monel metal or nickel.
Sturdy in construction,

• JUST PLUG IN AND TURN THE SWITCH



DE MATTIA GRANULATOR

For the uniform grinding of
Vinylite, Geon and all hard
thermoplastics. Capacity: 200
lbs. per hr. 3 H.P. motor
with double V belt drive.
Four Steel Chopper Blades.
Roller Bearings with Positive
Seals. Screen with ¼"
openings.



DE MATTIA Bench Model GRANULATOR

For at-the-machine operation
(Can also be supplied with
base for floor mounting).
Capacity: 75 lbs. per hr. 2
H.P. direct connected motor.
Roller Bearings with Positive
Seals. Screen with 11/32"
opening.



DE MATTIA CHUNK CUTTER

For low-cost salvage of
larger slugs and chunks and
molded pieces too tough for
the average sprue and scrap
grinder. Capacity: over 150
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NEW YORK 7, N. Y.

Bigger Handles

(From page 180)

building in bosses to raise the
handle above the hot iron and
thus allow ventilation. The same
idea is used in one form or another
in today's handles. Furthermore, it
was soon discovered that general-
purpose wood-filled phenolic was
perfectly satisfactory in the new
and heavier handles so asbestos-
filled material is no longer necessary
although it is sometimes used.

After an experimental period in
the early 1930's, phenolic iron handles
began to get bigger and bigger.
The advent of the steam iron in the
late 1940's gave added impetus to
the move to larger handles, although
several manufacturers are now using
handles on their dry irons which are
as large as those on their steam
variety.

Yesterday and Today

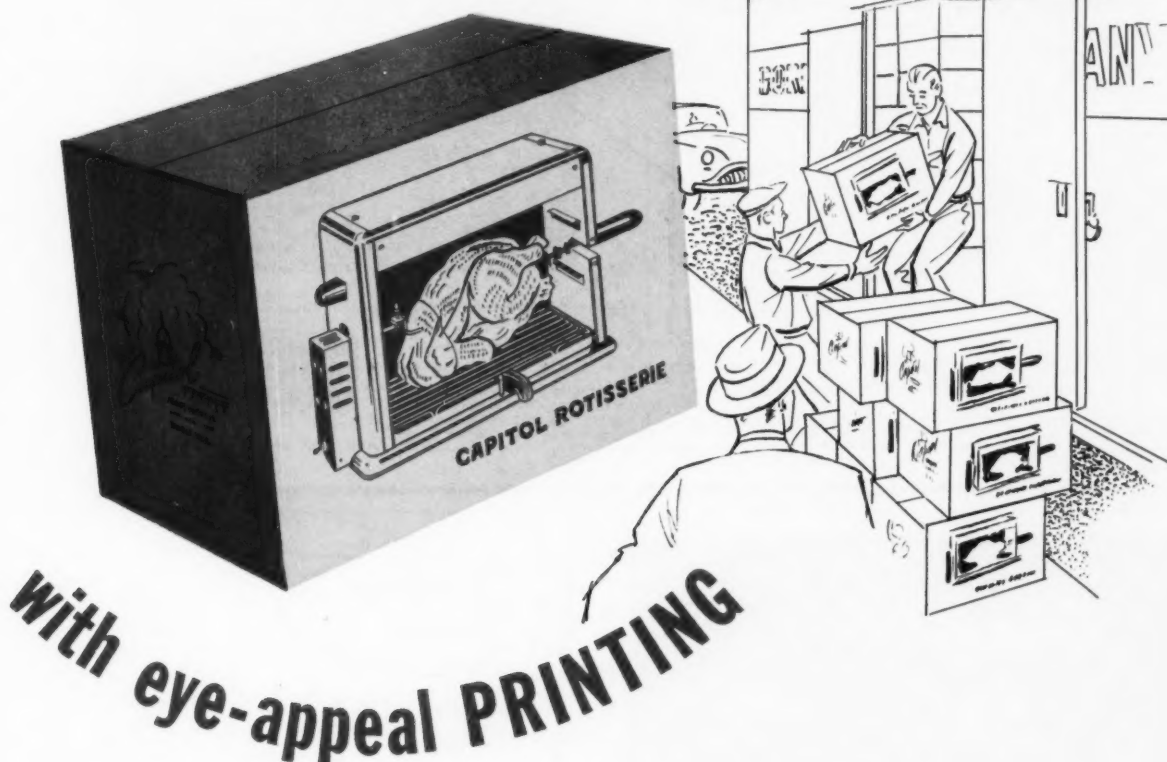
The handle on the Dominion
steam iron shown on p. 180 is typical
of the well designed, structurally
strong handles in use today. The
handle proper is molded in one large
piece, but there are four additional
small parts—the filler cap, back
plate, indicator insert, and indicator
knob. In the 1928 version, also
shown, the only phenolic pieces were
the cross-bar grip and attachment
plug parts.

In addition to giving streamlined
beauty in keeping with the modern
motif, the new handles give structural
strength as well as the thermal
insulation which was the prime motivation
for the early phenolic handles.
There are no longer exposed
metal parts to burn milady's beautiful
hands. The large size permits
use of hollow sections which help to
keep the handle cool. A completely
cored out handle may be the next
improvement. In most cases, large
handles are more comfortable and
give the operator of the iron a more
precise sense of control. Even a
thumb rest has been added.

It is probable that the advent of
the household steam iron would
have been delayed if large molded
plastic handles had not been available,
since bulk and insulation are
properties which are necessary in
the design of these irons.

All this improvement in handles
comes at no extra cost to the iron

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Remember, this traveling display is economical. You own the "billboards". . . for just the cost of plates and printing you add a strong link to your promotional chain.

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PAPERBOARD

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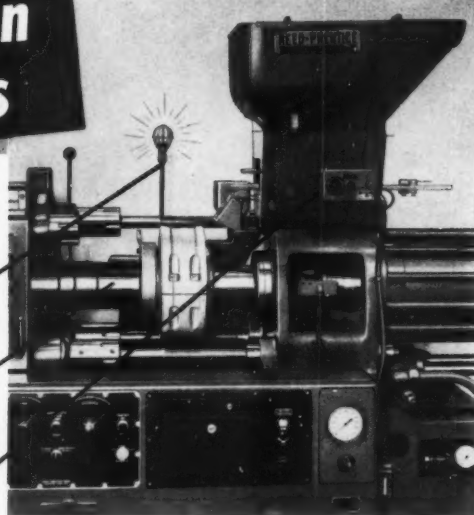
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• **"Reed-Weigh"** — the New Reed-Prentice weigh feed hopper unit for molding uniform, strain-relieved parts — saves material, cuts rejects on 175T-4/6, 10D-8, 10D-12, 300T-12/16 and 400T-16/20 oz. "Reeds".



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Modern Plastics

manufacturer. He pays anywhere from 25 to 60 cents for the present handles and accompanying parts, which is perhaps 5% less than he was paying for handles in the pre-war era. The price range varies according to size and style but there was the same sort of variation in earlier days.

Technical advances have been largely responsible for the development of larger handles at low cost. The molding cycle has been reduced from 5 to 2 minutes. Well designed, high production molds permit molding several pieces at once and take care of the complicated coring now necessary. Finishing operations have been reduced to almost nothing. Automatic mold component operation, transfer molding, and pre-heating have contributed immeasurably to faster, better molding with the percentage of rejects reduced to a negligible amount and quality of the product far superior to the handles of a decade ago.

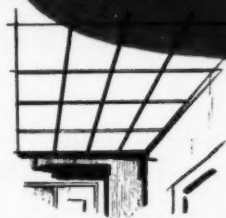
The number of irons produced in 1953 was 7,215,000 (most of them had phenolic handles) with a dollar value of \$117,000,000. Steam iron handles accounted for 3,950,000 of the total. In 1940 a little over 5,170,000 automatic and non-automatics were produced. First big year for steam iron handles was 1947 with 1,100,000 units. The biggest year was 1950 with 7,475,000 irons of all types; but only 1,645,000 were steam. The increasing influence of the steam iron is shown by comparing that 1950 figure with the almost 4,000,000 steam irons which were produced in 1953.—END

Built to Take It

(From page 151)

more severe beating or pounding—and everyone knows that it is common practice for the average householder to pound on the handle of a chisel or even a screw driver with a steel headed hammer. A good carpenter will use the heel of his hand or a mallet—but there are far more chisels and screw drivers in the hands of amateurs than professionals.

There are few if any low-cost materials suitable for tool handles that will take abuse as well as the cellulose. There is a lack of uniformity in wood due to grain, various types



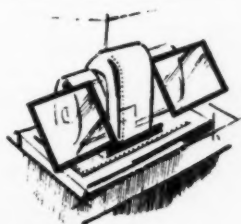
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Actual case histories vividly illustrate how Sheffield's design and development ingenuity have overcome seemingly insurmountable plastic application problems . . . page after page of photographs depict the complete engineering and production facilities that can produce a plastic extrusion to your specific need — your schedule — your budget . . . and — above all — you'll discover how Sheffield versatility can deliver a plastic extrusion with every quality necessary to enhance the performance, beauty and durability of your product.

SHEFFIELD PLASTICS



Sheffield, Massachusetts

of growth, sap stains, cuts, etc. Since plastics are uniform in structure, they are easier to fit to the shank of a tool—and they do not split.

Rotuba uses butyrate for most handle stock but has also built up good volume in lower-cost tools with acetate handles. Many handles for other tools than screw drivers and chisels, such as trowels, mallet heads, and spray guns, are also being fabricated from extruded shapes.

It should be noted that almost as many injection molded butyrate and acetate tool handles are being used today as are made from extruded shapes, but the Rotuba line is exclusively made up of extruded products.—END

It Had to be Sold

(From page 183)

of its kind in this field—was introduced.

Working in cooperation with its advertising agency, S & W constructed several actual room settings in which the Miraplas tile was installed for photographic purposes. These installations are highlighted in a new 8-page full-color booklet which has proved to be a powerful selling tool. The settings are also reproduced in a smaller full-color envelope stuffer for dealers which shows the broad range of actual colors in plain and marbled treatments now available in Miraplas tile.

Do-it-Yourself

S & W also pioneered "do it yourself" kits for the home owner who wants to install his own plastic tile. These kits contain all necessary materials for the job, along with complete, illustrated instructions. Although some dealers felt at the outset that such a kit might cut into their sales, this has not proved to be the case. On the contrary, the kit has led to much "plus" business and has also encouraged many kit users to turn to the dealer for professional installations on later and more involved projects.

Styrene wall tile had to be sold. And the sales effort involved both consumer and dealer education. That took time, patience, and fortitude. Obviously, the results were worth the effort.—END

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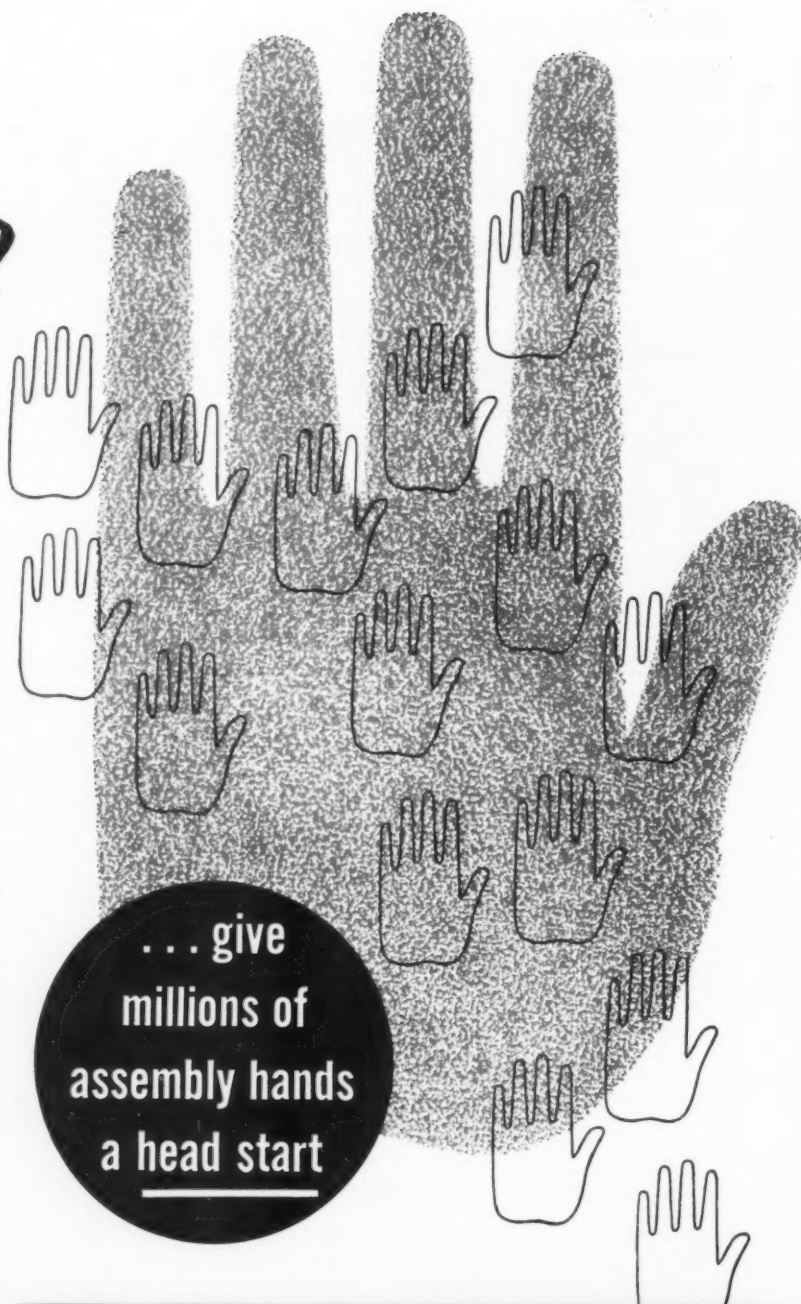
Automation is a new name for an objective long pursued by industry's keenest minds. It means successive elimination of manual operations.

In the production of metal or plastic component parts — by machining, molding, etc. — automation has made advances that in some cases seem almost magical.

By contrast, *assembly* often plods along slowed by outdated methods.

Progress toward automation *does not* end where assembly begins for manufacturers who take full advantage of the P-K Fastening Method. They *eliminate* manual operations like tapping, nut-running, inserts in plastic — and avoid the attendant trouble and expense. Automatic screw driving equipment can be used to further mechanize hand operations on many applications. Savings run up to 50% and more.

Complete automation is, for most, a *distant* dream. Meanwhile, assembly *hands* control your fastening costs. Find out how P-K Self-tapping Screws can *double — even triple —* their efficiency. It *pays — and pays well — today*. Talk to a P-K Assembly Engineer. Parker-Kalon Division, General American Transportation Corporation, 200 Varick St., New York 14.



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millions of
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a head start

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A



Phillips
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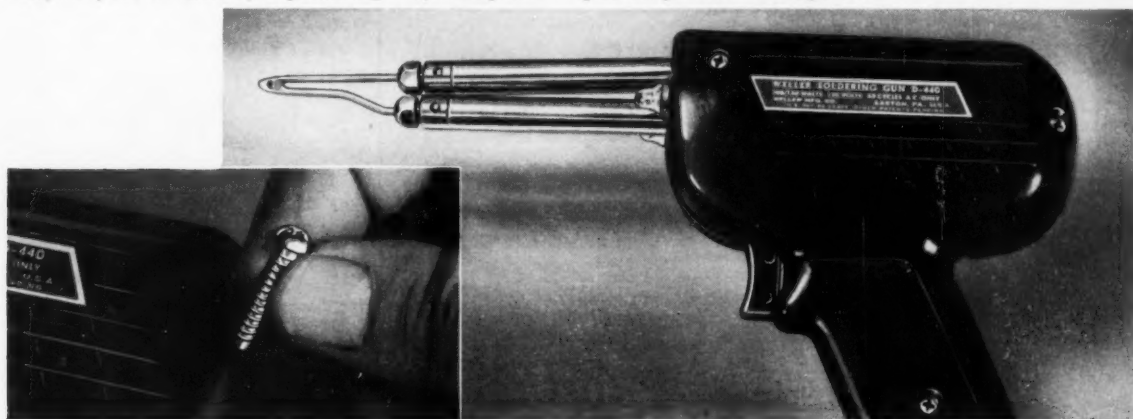
Hex Head
Z

IN STOCK

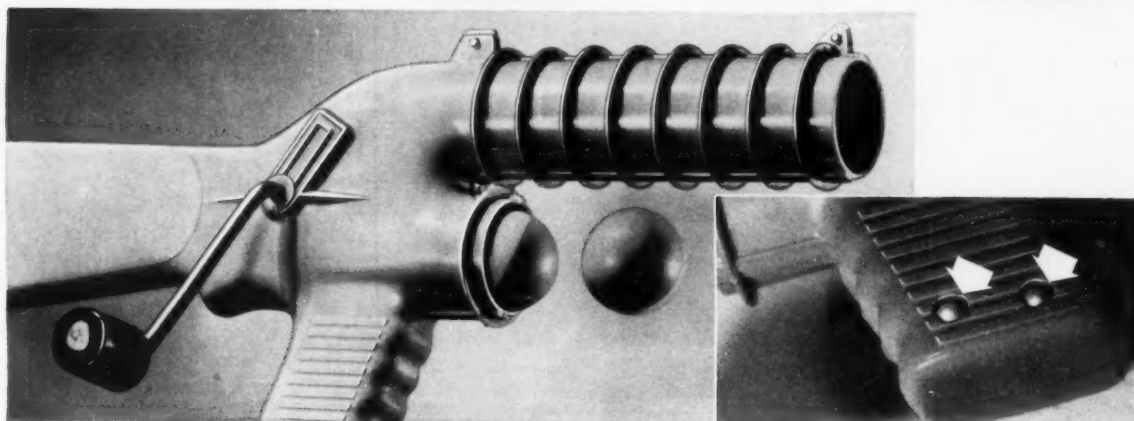
... see your nearby P-K Distributor ...

WELLER FINDS IT PAYS to follow its own advice. In selling its efficient Soldering Gun, Weller Mfg. Co. urges a look at assembly costs. A "turnabout" look at assembly of the Solder Gun revealed costly delays due to difficulty in positioning nuts, in deep recesses,

to receive machine screws. Weller ended delays, also trouble with loosening and lost nuts, by switching to P-K Self-tapping Screws. Three Phillips Head Type F-Z's fasten two halves of phenolic plastic handle together.



with P-K quality-planned assembly savings pay off



THE AIM'S THE SAME FOR KUZAN In toy guns, too, the aim is elimination of needless assembly operations. Kuzan, Inc., needed the simplest, strongest fastening method that would also foil Junior's

urge to take apart the Kazooka (it shoots ping pong balls). That proved to be 5 P-K Type U Drive Screws, easily and permanently pressed in to join the two halves of the Styron plastic case.

The Original

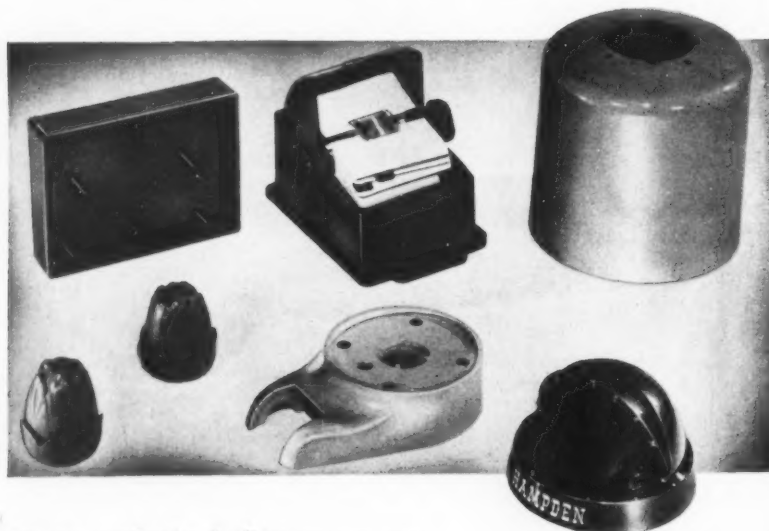
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You can have confidence in the competence of Leaf Injection Molding



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**LEAF
PLASTICS
INCORPORATED**

135 Woodworth Avenue
Yonkers, New York

Pans

(From page 175)

now 1½ oz. each. On the other hand, lid handles have declined in weight from 2 to 1¼ ounces. By and large, phenolic handles have become structural parts in themselves, fastened to the pans with screws.

For beauty, Flint-Ware handles are styled in a harmonious, free-flowing contemporary design which only one-piece molded plastics construction could afford.

According to Ekco's designers, the safety element is one of the most important features in handle design. Because no metal is employed in the handle itself, the utensil can be used inside the oven without fear of having a metal core expand and crack the plastic. There are also no exposed screws or metal rings which might become hot during the cooking process and cause accidental burns.

Styling also provides maximum utility. The curving twist design furnishes a secure grip for either right or left hand. To prevent accidental burns, the underside of the handle has a bumper guard of plastic on the front end so that the forefinger will not touch the metal ferrule of the pan itself. Cover knobs have an elongated shape to furnish a positive grip, and the new side handles have a ribbed undersurface to prevent slippage.

For sanitation purposes, the new smooth, solid plastic handles contain no crevices or ridges where dishwater, dirt, or food particles can lodge. Their high heat resistance also enables them to be immersed in boiling water for sterilization purposes with no danger to the handle finish.

Prior to their introduction, Flint-Ware handles were tested to withstand oven temperatures of 450° F. for 100 consecutive hr. with no damage to the handle itself. Such an advance is possible, Ekco feels, because of the improvement in formulation of materials, and better molding technique and design. These are the principal factors responsible for making plastic handles do a better job now than they did only a few years ago.

CREDITS: Phenolic molding material supplied by Bakelite Co. Molding is done for Ekco by Chicago Die Mold Div., U. S. Rubber Co., and Breyer Molding Co., both of Chicago, Ill.

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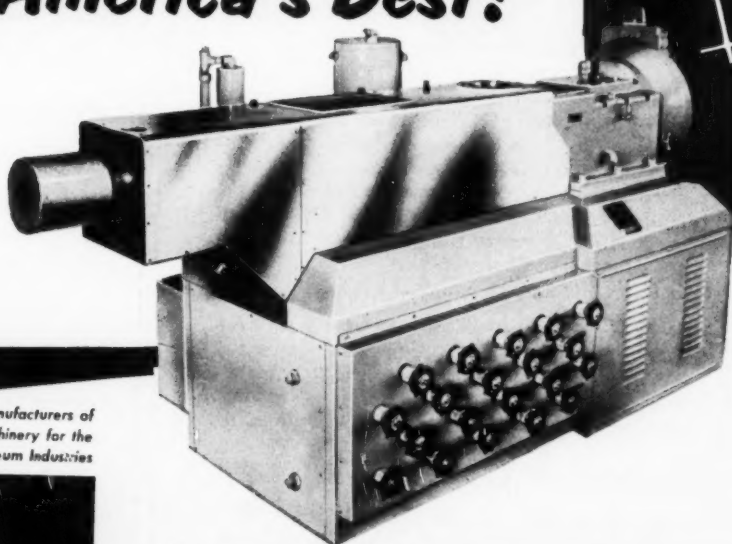
BOOTHS 610-12

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June • 1954



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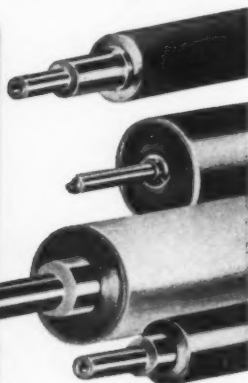
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PYROMETERS

Bulletin 194-S gives details of these instruments. They help save money and make better plastics.

HINGES... for PLASTIC BOXES

press-fit assembly

(Holds like

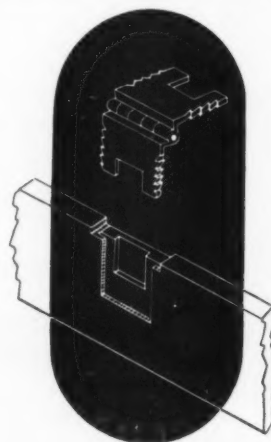
a drive-screw)

with

or without

double action

"C" Springs



GEISSEL Mfg. Co., Inc.

109 LONG AVENUE

HILLSIDE, N. J., U. S. A.

Phenolic + Wood

(From page 152)

that the cutlery will slice easier; resistance to bacteria, an important feature for protection of health; grain and finish superior to the finest hand-rubbed, imported hardwoods; smooth to the touch and an "appearance and feeling of true royalty to fine cutlery"; an extremely hard surface that is impervious to chipping or marring; resistance to burns and stains from all common household acids; will not discolor; will last a lifetime.

Retail prices of flatware sets vary from \$30 to \$60. The handle is the same in both cases. The more costly sets have blades forged from solid steel bars—the lower cost sets are stamped steel. Total cost to the purchaser is a little less than the price of plated silverware, but Voos flatware prices are slightly higher than run-of-the-mine stainless steel flatware now on the market.

Other cutlery items such as steak knives, butcher knives, slicers, game shears, salad sets, and carving sets made by Voos are now about 75% Pakkawood handles. Most of the remaining 25% are stag, horn, or rosewood. Low-cost cutlery of this type generally employs injection molded plastics and maple or beechwood handles.

The handles on Voos flatware are from 4 to 5 in. long. Handles on kitchenware are of varying sizes depending upon the type of tool desired. The Pakkawood is furnished in blocks by the Adams Plastics Co., Inc., Holyoke, Mass. Some handles are fashioned into one piece jobs. In other cases the block is split, finished, and then riveted into place on the shank of the cutlery. Adhesives are also used for fastening—sometimes no rivets are employed. Voos doesn't say what adhesive is used but it must be one that will neither swell nor shrink and can withstand the same abuse from steam and hot water as the handle.

Voos, as well as other cutlery manufacturers, seem to be well convinced that phenolic impregnated wood handles have made a real and lasting improvement to the industry in the form of a permanent handle for high-grade stainless steel cutlery that will draw little if any complaint from the purchaser.—END

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LOS ANGELES 23, CAL. LITTELL HARDWARES SALES CO.—654 S. Anderson St.	

Distribution

(From page 163)

for storage of the dozens of items around the home—ranging from screws and washers to thumb tacks, seeds, spices, and buttons—which are always difficult to find.

Molded polyethylene jars, now in production by several manufacturers, offer a lightweight, shatterproof replacement for the conventional heavy glass jars customarily used for cold cream and similar cosmetic preparations. One version features a double wall construction with insulating air space which helps to prevent chilling or overheating of the product regardless of outside temperatures. Another type of double-capped, heavy walled vial is widely used for packing instrument ball bearings immersed in oil, valuable machine parts for the munitions, aircraft, and automotive industries, and similar heavy items.

For its newest product, Stopette cream deodorant and anti-perspirant, Jules Montener, Inc., has developed a "self-applying" case molded of white urea, with labeling information silk screened in bright blue. The swivel-type case, which resembles an over-size lipstick, raises or lowers the stick of deodorant when the base is rotated. The urea material is completely odorless and unaffected by the product, while its dimensional stability insures smooth operation of the swiveling feature and a secure fit of the cap which guards the product against drying out or cracking.

250 Million Bottles

Probably the biggest success story in plastics packages is the blow-molded polyethylene bottle, now estimated to be in use for some 3,000 products. Although spray deodorants (the original consumer application) and shampoos currently head the list of products involved, new uses are being found daily for these lightweight, unbreakable, self-dispensing containers. Total production of flexible polyethylene packages during 1953 was estimated at approximately 150 million units, and it has been estimated that this figure may reach a quarter of a billion in 1954.

The fact that pressure exerted on the sides of a polyethylene bottle

(To page 282)

Modern Plastics



VIN-ROCK, INC.

Telephone ATLantic 1-3866

8211 ALMIRA AVE • CLEVELAND 2, OHIO

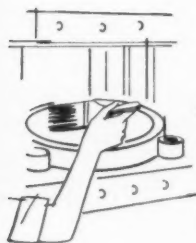
*Important
pass this on*

To executives charged with responsibilities
of Plastics Design, Development and Production

This is intended to call your attention to Vin-Rock with
Vinium* -- liquid Mold Releases now widely employed by manufacturers
of plastic products. We suggest that you investigate these Releases
They reduce rejects ... speed production ... eliminate delays caused
by mold sticking.

*big savings
here...*

2 releases are available. Type V-1 is for injection molding
plus certain rubber molding and metal die casting. Developed primarily
for use with polystyrene, it is also employed for the release of all
thermoplastics including acrylics, vinyls and nylon. Type R-2 is for
compression molding, laminating, casting and reinforced plastics. It
is used with phenolic, polyester, epoxy and methacrylate plastics.



V-1 and R-2 Releases are packaged in 12 ounce spray cans ...
also, in quart, gallon, 5-gallon and 55-gallon containers. They can
be brushed, sprayed or wiped on molds in accordance with the method
best adapted to the users' processes. And - colorless, non-staining
V-1 and R-2 have no effect on "paintability" of any product ... or
ability to cement product pieces together.



*painting
OK!*

*Solve
tough problems...*

If you have problems involving mold sticking or excessive
rejects, it may pay you to write or phone for a discussion of your
situation. We will be glad to serve you.

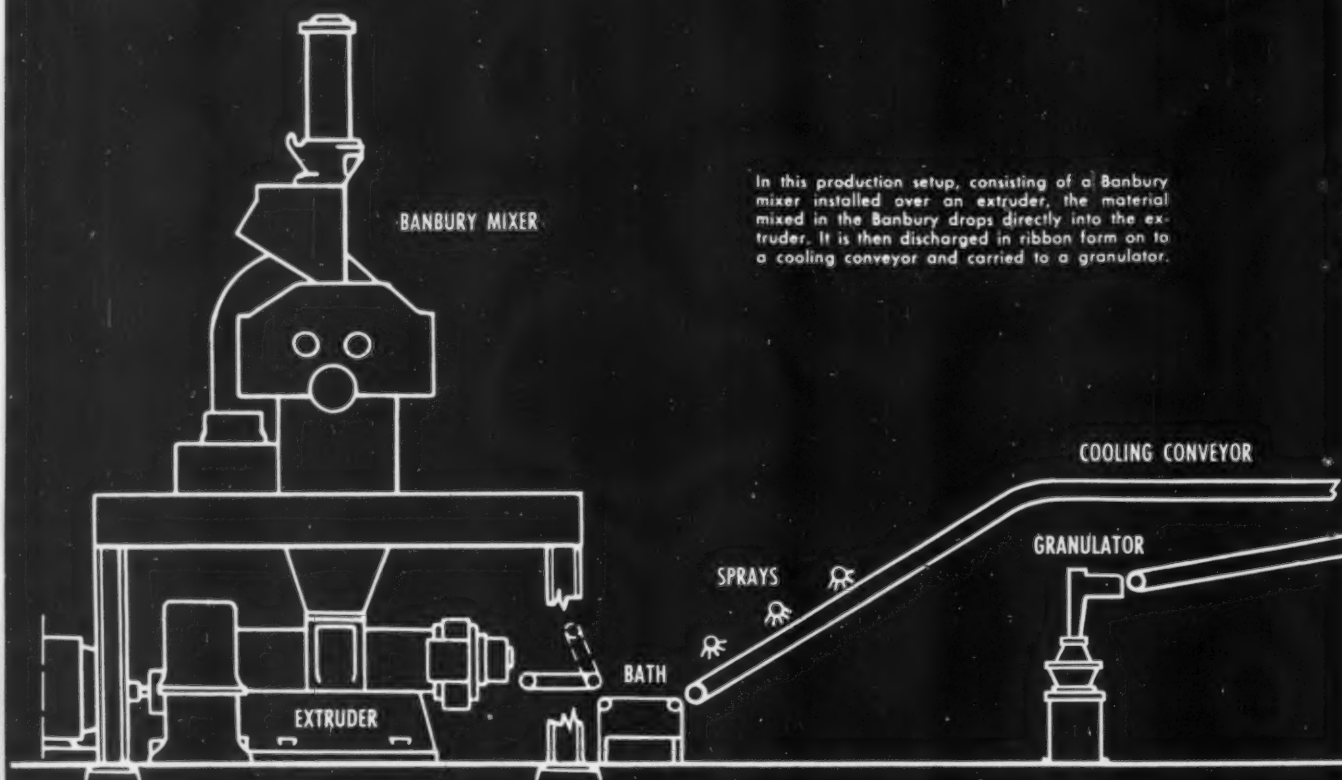
*Ask for
Data Sheets!*

Sincerely,
Vin-Rock, Inc.
Vin-Rock, Inc.

*See Vin-Rock at
National Plastics Expo
Booth 903*

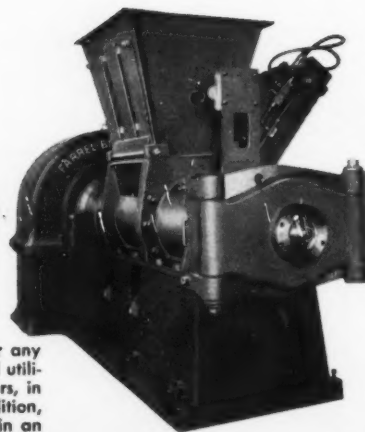
VINIUM is a combination of chemicals which penetrates, produces
a hard, smooth, glossy surface and destroys affinity of plastic for the mold.

Here's a ***SIMPLIFIED,***



In this production setup, consisting of a Banbury mixer installed over an extruder, the material mixed in the Banbury drops directly into the extruder. It is then discharged in ribbon form on to a cooling conveyor and carried to a granulator.

Banbury mixers, widely used in the processing of plastics, produce uniformly mixed stocks, reduce production cost and eliminate dust and fume hazards. They are made in a range of standard sizes to suit any capacity requirements.



Farrel-Birmingham extruders can be built for any capacity and provide the ideal answer to full utilization of maximum Banbury output. Extruders, in most cases, eliminate all hand milling. In addition, stock worked by the screw in a single pass in an extruder chamber is more uniform than that of milled stock.

IMPROVED method of producing plastic materials in granular form

The highly efficient processing system blueprinted here, has been installed by a number of large chemical companies to process plastics in preparation for granulation.

Operation is from a central control panel, and a continuous, even flow of production is maintained at all times by automatic cycle control of the Banbury mixer, with extruder feed regulated to suit the cycle. The material is mixed and blended in the Banbury, and then delivered in chunk form to the extruder, where the stock is further worked by screw action under close temperature control. An air-operated ram in the hopper automatically provides constant feed to the screw. A continuous strip is extruded from the die head through a water bath to a conveyor, where the material is further cooled on its way to the granulator.

Another application for this production

setup is for the reclaiming of vinyl scrap. The scrap is mixed and blended in the Banbury, then discharged into the extruder, where it is strained and extruded in strip form for subsequent cooling and granulation.

These production units illustrate the type of service performed by the Farrel-Birmingham engineering planning division, which is staffed by men with great experience in the design, application and operation of machinery built by the company. Two other typical examples are shown below—one for vinyl phonograph record blanks, and the other for plastic film, sheet and coatings.

If you are thinking of modernizing or expanding your facilities, call on Farrel-Birmingham engineers early in the planning stage. They can help you lay out a production unit that will improve efficiency and cut operating costs.

FARREL-BIRMINGHAM COMPANY, INC., ANSONIA, CONNECTICUT

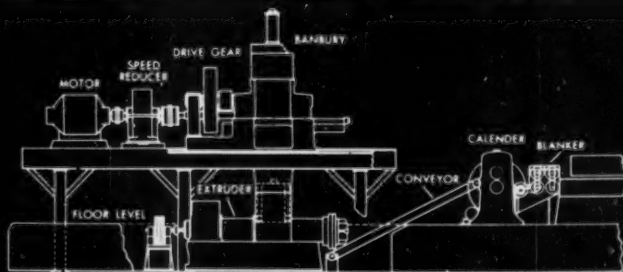
Plants: Ansonia and Derby, Conn., Buffalo, N. Y.

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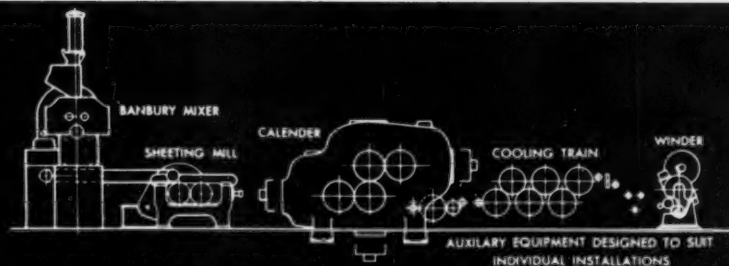
FB-929

Setup designed for the production of blanks from which phonograph records are made. The extruder receives stock directly after processing in the Banbury. The extruded strip is conveyed to the calender and blanking unit.



TWO OTHER FARREL-BIRMINGHAM MATCHED PRODUCTION UNITS

The combination of the Banbury mixer, the two-roll mill and the Farrel-Birmingham "Z" calender has for years been considered "standard equipment" for the production of high-quality plastic film, sheet and coated fabrics. The sizes of these units in relation to one another are established by the type of production, with capacities calculated to permit a continuous and balanced production flow.



the Company that's known by the Company it keeps

The list of customers of Michigan Molded reads like a "who's who" of American industry. We are proud of the list . . . and prouder still to have earned the confidence of so many blue ribbon companies. It all reflects the efforts of thirty years of pioneering in plastics molding—

injection, compression and transfer.

We are happy to have the facilities and the talent for creative and productive service to American industry.

*to be first
consult the one
who does
it first!*



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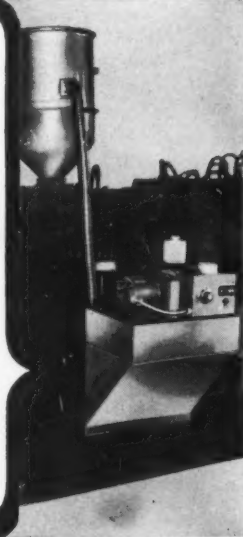
*your inquiries will receive our
prompt recommendations and proposals*

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D&W HOPPER-DRYER

Efficient pre-heating and de-humidifying of material is just one of many jobs done by this timesaving accessory. It speeds production by eliminating handling—because material goes directly to the machine from receiving. No need to load and unload drying ovens. You save floor space, too, because the Hopper-Dryer can be installed easily on standard makes of injection or extrusion machines. Initial cost is less than a drying oven's. Operating cost is low, results are sure.



New Hopper Loader — For continuous automatic feed of any injection or extrusion machine. Clock timer control for starting and stopping. Dust-free operation. "Die-Temp" Control — Positive-acting, self-contained mold temperature control at any level between 100-400 degrees F. Fast, compactly built to save space.



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THORESON-McCOSH, Inc.

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gives it built-in dispensing properties is probably the single greatest attraction of this container to packagers and consumers alike. It makes possible such products as catsup containers shaped like a tomato, combination squeegee-washers which apply de-icing fluid to auto windshields, and squeeze-bottle dishwashers with a brush and dispensing valve built into the cap for application of liquid soaps.

For its recently introduced dietetic sweetener, Sweeta, Squibb adopted a diminutive polyethylene bottle which is the acme of convenience. Easily carried in purse or pocket, it includes a molded plastic cap which will dispense as little as one drop of the liquid.

In the industrial field, Crystal Research Laboratories, Inc., Hartford, Conn., found a stock polyethylene bottle ideal for replacing brake fluid in hydraulic brake systems. This has always been an inconvenient task due to the inaccessibility of the master brake cylinder on most automobiles. The new Crystalab Handy-Quick brake fluid dispenser consists of a bottle with transparent plastic feed tube. The filling station attendant simply places the end of the tube in the master cylinder opening, inverts the bottle, and squeezes. The bottle carries two printed scales showing amount of fluid remaining.

A dry chemical fire extinguisher recently introduced by the X-Pyr Co., Chicago, Ill., for home and auto use also employs a stock polyethylene bottle. It is fitted with a molded phenolic dispensing cap which effectively discharges a fire-smothering white powder when the bottle is inverted and squeezed. The red polyethylene bottle, with instructions printed in bright yellow, is refilled by unscrewing the plastic nozzle.

Water Wizard, Inc., Chicago, Ill., uses a stock blown polyethylene bottle in an ingenious device which converts ordinary tap water into distilled water for use in steam irons, batteries, chemical determinations, photographic darkrooms, etc. Screwed to the top of the 12-oz. bottle is a polyethylene cartridge containing ion exchange resins. When the bottle is inverted and squeezed, the water is forced through the cartridge, emerging with less than ten parts per million of mineral impurities.

Polyethylene collapsible tubes

Modern Plastics

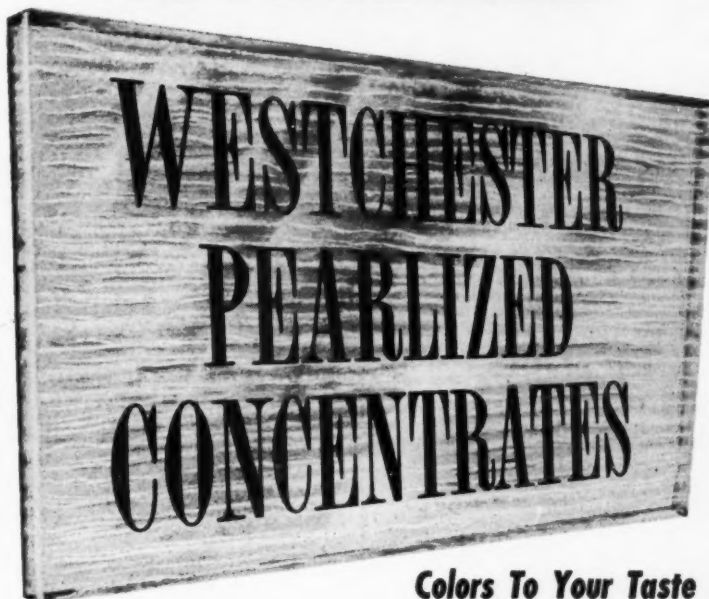
produced by the blow-molding process have proved to be ideal for certain hard-to-package food products, such as cocktail cheese spreads and similar gourmet items. These attractively printed tubes, pioneered by Sue-Ann Food Products, Chicago, Ill., are fitted with molded styrene dispensing caps with orifices which give a decorative shape to the spread as it emerges from the tube. Unlike a metal tube, the plastic containers do not become crushed and twisted as the contents are removed, but hold their original shape.

Another type of plastic tube container, introduced recently by a West Coast organization, has proved useful for packaging many "problem" products. This tube is formed of flexible vinyl chloride by a dipping process, making it resistant to a wide range of chemicals. It is filled from the bottom and electronically sealed; the tip is punctured or cut off to release the contents. This form of tube is particularly well suited to "one shot" packages whose complete contents are removed when first opened. Weight is only one-third that of lead tubes. Due to their toughness, the plastic tubes require no protective container, but may be stapled directly to a display card through the sealed bottom flange. Small metal parts, packaged in oil, can be sterilized after packaging without the tube softening.

Costwise, the vinyl tube is said to be competitive with tin, lead, or aluminum tubes. The plastic composition can also be varied to meet special requirements for chemical, oil, and grease resistance. Among the users of this tube is California Ink Co., which supplies pigments to more than 80 different private-label customers in the paint industry. As compared to the collapsible metal tubes which they replace, the vinyl tubes are lighter, do not dent, and are much more flexible, making it possible to squeeze out the full contents.

An interesting combination-use of plastics containers was found by White Labs., Newark, N. J., in a promotion campaign for its line of ointments and lotions for skin disorders. The company packaged samples of its medicinals (contained in six collapsible tubes and one blow-molded polyethylene bottle) in miniature pharmaceutical jars molded of pure white modified polystyrene, and sent

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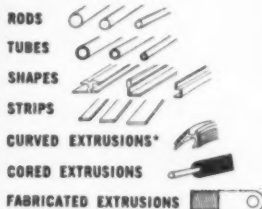
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EXTRUSIONS

Plastic precision Extrusions made to your exact specifications.



- No die charge for rods and tubes regardless of diameter
- Exact color matching
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12 page illustrated brochure describes 36 applications, gives details on materials, contains property tables.

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these to about 20,000 physicians. The lightweight, break-resistant jar, with rococo, old-style, decal-type drug label, made a colorful, attention-getting package.

Only a few representative applications of plastics bottles and vials have been detailed here. As new materials with even better properties are developed, as improved production techniques and equipment are perfected, as more and more designers become aware of the advantages of plastics in a multitude of bottles and vials for specific uses, the field will expand accordingly.

CREDITS: Producers of containers specifically described in this article, listed in sequence, include: Wood screw containers—Extruded Plastics, Inc., Norwalk, Conn.; Styp-It container—Lusteroid Container Co., Inc., Maplewood, N. J.; Empteers—Celluplastic Corp., Newark, N. J.; double-walled jars—Imco Container Corp., Kansas City, Mo.; ball bearing vials—Celluplastic Corp.; Stopette cream case—Formold Plastics, Inc., Blue Island, Ill.; Sweeta and brake fluid containers and X-Pyr fire extinguisher bottle—Plax Corp., Hartford, Conn.; Water Wizard bottle and cheese tubes—Mills Div., Continental Can Co., Chicago, Ill.; flexible vinyl tubes—Wallace Container Co., Los Angeles, Calif.; apothecary jar—Dillon-Beck Mfg. Co., Hillside, N. J., and ointment bottle—Plax Corp.

Glamorized

(From page 171)

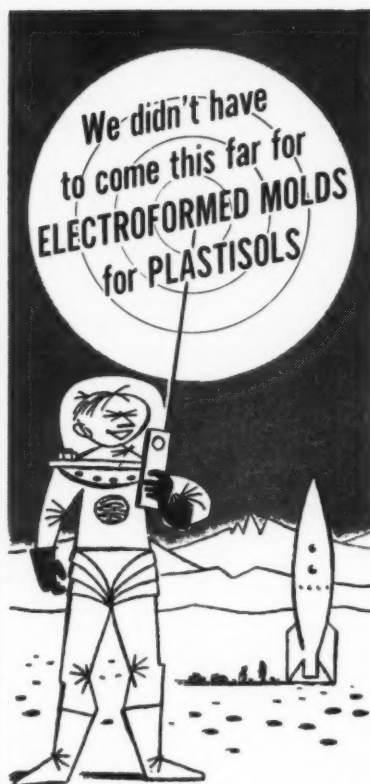
over chipboard and an acetate window. The round ones have a vinyl top and bottom with sides of 15-gage acetate sheet that has a beaded edge so it won't lose shape.

Waste baskets have a vinyl covering and a thin vinyl lining that can be removed for cleaning.

An infants' line includes a washable quilted vinyl hamper, a shoe bag to hook over the crib, and a miniature chest for baby clothes.

Fabricators of such accessories say that the vinyl film with which they are working is considerably superior to that of a few years ago. Uniformity of color for one thing has been a highly important factor because most housewives prefer to follow the same color scheme once they have chosen their first item. In addition, present-day film has such uniformity of gage and texture that there is little trouble in using automatic fabricating equipment.

CREDITS: Vinyl film used in Enrich products is supplied by Goodyear, Monsanto, Firestone, Elm, and Harte. Acetate sheet is from Du Pont.



NO NEED for interplanetary travel; Plastiplate Co. is much handier! Starting with no more than your design for a plastisol molded product—we'll construct your waxes and masters, then deliver to you as many complete molds as your production line requires.

And they'll be *precision*, close tolerance, "peas in a pod" molds; uniform in weight and dimensions to insure maximum uniformity in production.

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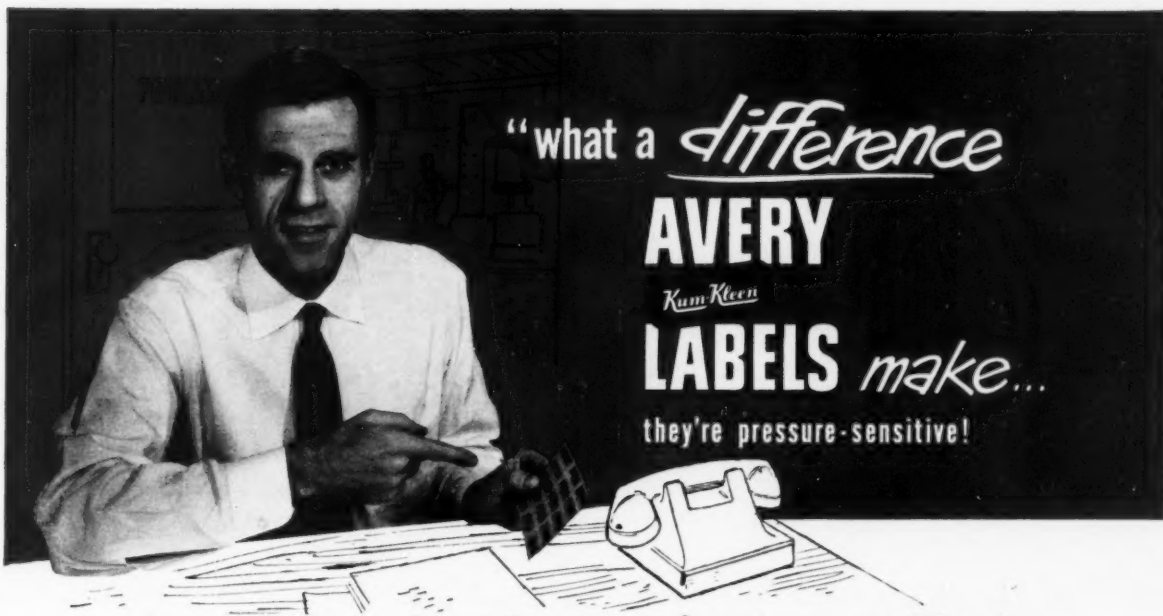
P. S. Remember too that Plastiplate is one of the country's largest and most experienced electroplaters of such small plastic pieces as buttons, beads, and novelties. Any metal finish, any color.



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Modern Plastics



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LABELS *make...*

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*they sure speed production...there's no moistening
—no waste motion!"*

Consider these practical labeling advantages!

■ *All waste motions are eliminated*—for unlike ordinary labels, Avery Pressure-Sensitive Labels are applied dry! An automatic dispenser pops them out—the operator simply *lays* the label in place on the product or package—without moistening. That's all there is to it!

■ *Production line speed*—Avery dispensers speed every type of labeling job—whether it's a single item or a thousand. Labels are fed, *one-at-a-time*, ready for instant application. There's no sorting of loose labels...no messy glueing or licking...no soiled, spoiled packages.

■ *They stick, and stay stuck*—Avery Kum-Kleen Labels stick to any clean, smooth surface—*right now*—and will not curl, peel or pop off! That's why Avery Kum-Kleen Pressure-Sensitive Labeling is different...it's practical and economical. Write now for details—free sample labels—case histories!

**SPECIFICALLY
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*how to handle
a hard-to-label surface...*



Kirkhill, Inc., selected a transparent, Polyethylene bag to give extra sales appeal to their line of faucet repair kits. These kits each contain some 30 different items for repairing almost any conceivable type of swing spout faucet, and this plastic bag made an ideal display and a perfect package.

But how to identify it...how best to show off the Kirkhill brand? Avery Pressure-Sensitive Labels, of course! These attractive labels stick instantly to the flexible plastic surface—without drying out or popping off! They stick—and stay stuck...they identify both the product and the manufacturer. Where can you use quick, clean Avery Labeling in *your* business?



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For matched-die molding

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- Exceptional flow
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Also available in a light stable grade (AROPOL 7100LS).

NEW

For corrugated sheeting

- Excellent light stability

AROPOL 7110LS

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NEW

For general molding use including hand lay-up

- Good chemical resistance
- Ideal for use in tanks, boats, etc.

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Type Rigid
Styrene content 25%
Viscosity at 25°C, cps 2700

NEW

For flame-resistant plastics

(Both matched-die molding and hand lay-up)

- Exceptional flame resistance
- High resistance to heat distortion

AROPOL 7200

Type Rigid
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Also available in a light stable grade (AROPOL 7200LS).

NEW

For flexible plastics

(For blending with rigid resins)

- Permanently flexible

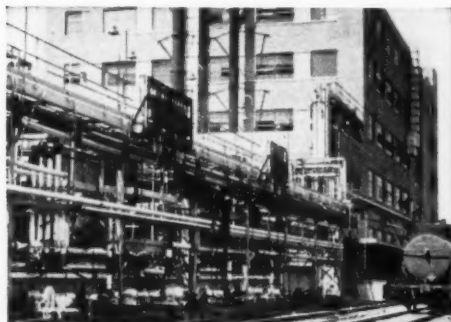
Imparts flexibility and toughness to rigid resins, makes them more resistant to shock and to impact when proper fillers are used.

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Miscible with styrene monomer and all Aropol polyesters.

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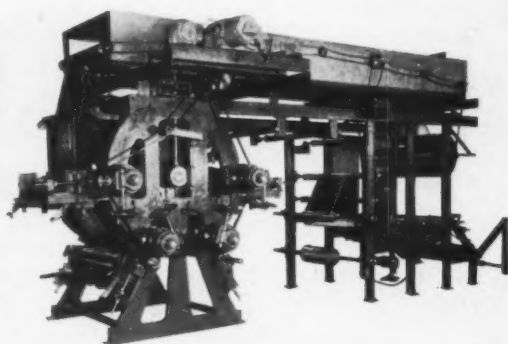
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4 Star Press 4 for Color Printing

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NEWS! Ingenious supported-web construction solves register problems for plastic film printers.

Introduced only last year, the Lembo 4-color Supported-Web Press is fast becoming the favorite of critical printers. And here's why . . .

The supported-web construction permits *in-register* printing at high speeds, even with polyethylene and other extensible plastic films. All the strain of going through the rollers is taken up by the continuous blanket. The web is *carried*—not pulled—from impression cylinder to impression cylinder, assuring perfect printing at speeds from 0 to 500 feet per minute.

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- ★ **EXTRAS** Can be equipped for gravure printing, and with rewinds for cellophane or paper

An appointment to see this superior press in operation can be arranged at your convenience. Write for full particulars and quotations.

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up to twelve
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Manufacturers of Printing Presses and Cylinders

"New Look"

(From page 131)

necessary before the vinyl drapery market can recover much of its lost volume.

Even if the film used in window drapes was no better than that available five or six years ago the finished drapes now on the market would still be immensely different. The greatest improvement has been in texturing, which is done by various embossing processes to obtain a simulated textile finish of most any desired type. Today there is almost no market left for plain, flat surfaced drapes. Not only has the range of textures become exceptionally broad, but the embossing is deeper, more detailed, and more permanent. Availability of a more complete line of patterns has also become possible because printers have learned how to handle the more difficult and complex designs and have overcome the most exasperating problem of registry on a flexible material.

The garish, loud, and gaudy colors so prominent a few years ago can still be obtained—after all, they were designed for a clientele that wanted them that way—but lighter and more conservative colors are much more prominent in present day drapes designed for customers with different tastes.

But all this improvement is making neither film producer nor converter very happy from a profit viewpoint. Almost every improvement in quality and styling has added to production cost, yet most drapes still sell at retail for about \$1.98. Each set contains about 2.8 yd. of 54-in. material and the film alone before it is printed or embossed costs from 75 to 80 cents. The standard mark-up by the retailer is 40% so the converter and fabricator is left but little margin in which to operate.

As a result of this squeeze there has been some yielding to degradation of the product. Early drapes were 4 mils thick but there was a time not long ago when even 2-mil film was not uncommon. By and large the industry has adopted a 3 to 3.4 thickness, but there are many in the industry who would not only like a heavier film but also a wider curtain to give added "class."

Cottage curtains in vinyl have

also suffered a severe decline even though they may have a more natural market since they are ideally suited for kitchen and bath room.

Although vastly improved in styling and design over the past two or three years, they too have held to a fairly standard price of \$1.98 compared to cotton curtains that sell generally from \$2.50 to \$5.00 a pair.

Better Printing and Inks

Biggest improvement, as in drapes, has been texturing. They can be obtained with textures like satin, bark, crinkle, piqued, basket weave, crepe, or most any fabric finish. Styling and printing has been changed to more conservative and dignified patterns and the printing looks much better and softer on the embossed textured surfaces than it ever did on the smooth, shiny surface of flat film.

Converters assert that their inks are now easier to handle and give better results and that the embossed surface of the film permits toning down or softness of color.

Curtain producers also say that the film now available is easier and better to work with because of less variation in thickness, more uniformity of color from one order to the next, and good light stability—a highly essential property in a window curtain.

The eye and feel appeal has been perhaps the greatest factor in the growth of the vinyl cottage curtain. From a few feet away they look like textiles; the feel is almost as deceiving.

Some day a designer may come along who can fashion a style for vinyl cottage curtains that will take advantage of their own particular properties and give them a new and individualistic appeal entirely different from textiles. But until the day comes, producers seem content to pattern them after the better textile designs. Since the housewife is familiar with and partial to textile patterns she is now content to have her vinyl curtains look like fabric and at the same time take advantage of their superiorities such as ease of cleaning and resistance to grease or stain.

CREDITS: Film in products illustrated is Krene by Bakelite Co., printed and embossed by Toscana Fabrics Inc.; draperies shown are fabricated by Midwest Marko Inc.; cottage curtains by Weiss & Klau, Inc.

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- Automobile parts
- Sporting goods
- Electronic components

Mother Never

(From page 129)

each cover to facilitate its removal from the dish.

Molded polyethylene freezer and refrigerator containers—available from companies such as Rogers, Columbus, Plastray Corp., Detroit, Mich., and Tupper Corp., Farnumsville, Mass.—are produced in translucent pastel or solid opaque colors.

Styrene Dustpan

Another application that illustrates what can be done with plastics if proper molding methods and sound judgment in design are used is an all-styrene dustpan being marketed by Rogers. Although the dustpan is one of the most used and abused articles in the entire household, the plastic dustpan—thanks to thick wall sections and molded-in ribs—will stand up under many years of service.

Since the pan is molded in one piece, additional features are incorporated which would have been impossible to duplicate in a metal pan selling for the same price. For example, small legs molded-into the bottom of the dustpan tilt it at just the right angle to receive the dirt as it is swept over a molded-in curved lip into the pan.

Equally functional and attractive are two other items which Rogers offers—the perennially popular plastic salad set and a plastic bread box.

The salad set by Rogers is a handsome 7-piece ensemble that includes a large bowl, four small bowls, a salad fork, and a salad spoon. The accent is on glamour. Each of the lightweight molded pieces is styled to harmonize with modern decor in today's kitchens. The set is available in combinations of black and chartreuse and black and yellow.

Bread Boxes

Continuous improvements in the design of plastics bread boxes by Rogers, Columbus, Beacon, Loma Plastics, Inc., Ft. Worth, Tex., and other manufacturers in the field, have won for this application a permanent place on the shelves of American homes.

The Rogers bread box, for example, is a streamlined, compact unit designed to hold two full-size loaves of bread. It is molded of Monsanto's

(To page 294)

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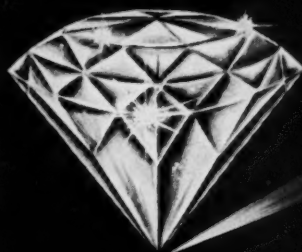
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Cut Tool and Die Costs—

Cost: \$500

Vacuum Mold For Boltaron 6100. 42 units can be turned out by this mold in the time it would take to produce two comparable units by injection molding. While the vacuum molded pieces must be dinked or trimmed, the savings in molding time and tooling more than offset the cost of finishing operations. ➡

Cost: \$3500

Injection Mold For Comparable Production. Note that the injection mold costs seven times as much as the vacuum mold. In every case, however, the advisability of using either vacuum or injection molding methods should be determined by the individual job and the quantities involved. Since vacuum molding cuts die costs considerably and lowers tooling time, it should be considered when you plan your next production run of plastic parts. ➡

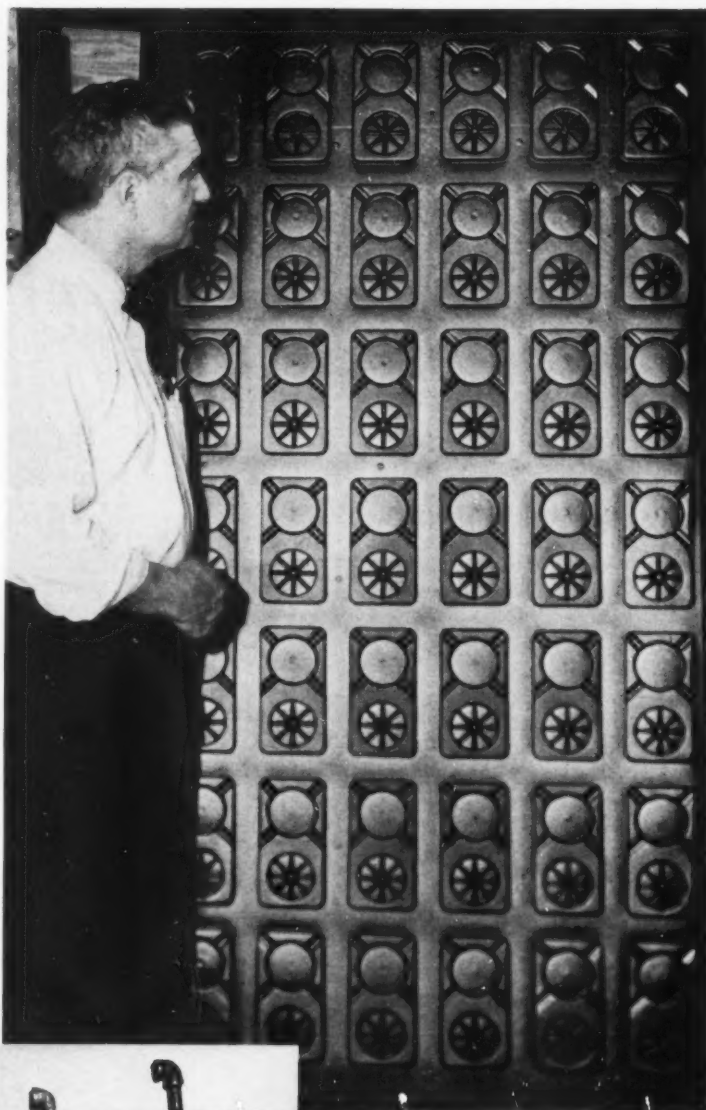
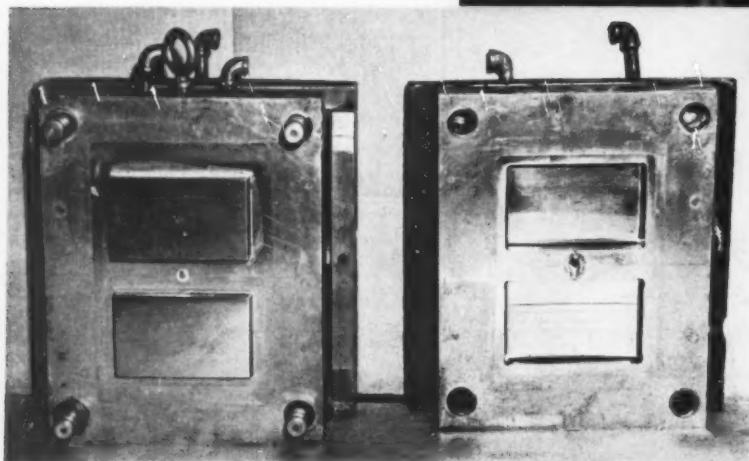


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Boltaron 6100 combines many important advantages of both plastic and rubber. It is abrasion-resistant, stain-proof, and easily formed by conventional low-pressure molding methods.

Untrimmed standard sheet sizes of Boltaron 6100 include 32" x 62" and 35" x 72", with thicknesses from $\frac{1}{4}$ " to $\frac{3}{8}$ ".

Boltaron 6100 is already widely used for such diverse applications as carrying cases and tote boxes, inspection and material handling trays, business machine housings, advertising displays, radio-TV component parts, airplane and auto trim. It has amazing versatility.

Send for descriptive literature and list of fabricators today. Address: Boltaron Division, Box 601, BOLTA PRODUCTS, Lawrence, Massachusetts; Division of The General Tire & Rubber Company.

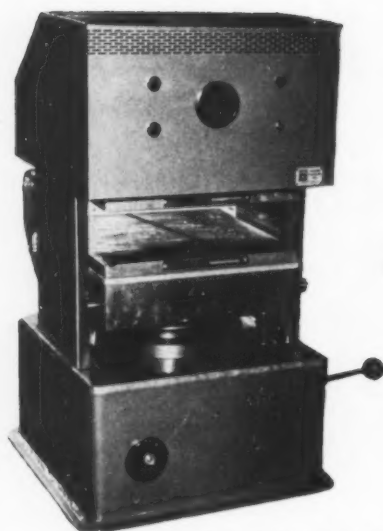
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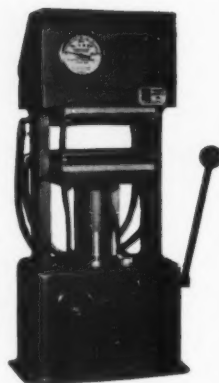
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Lustrex styrene in three separate parts. The base is produced in red or yellow, the cover in gleaming white. A pair of molded-in projections in the base and a set of molded-in holes in the cover interlock to form the hinge on which the cover swings. A rectangular slot designed to receive the styrene nameplate—molded in red or yellow to match the base—is molded into the cover.

The bread box molded by Loma has a curved cover which slides back into the top of the housing to provide easy access to the breads, cookies, or rolls stored in the spacious interior.

The Loma bread box is molded in three separate parts—cover and base are simultaneously molded in a 2-cavity mold and the shell housing is molded separately in a single-cavity mold. The base mold has a spring loaded movable insert which forms the roller bearing.

Waste Baskets

In addition to the refrigerator containers described above, polyethylene is finding its way into many other applications in the housewares field. Loma, for example, is marketing a polyethylene waste basket. Molded in one piece from polyethylene supplied by Bakelite Co., the Loma basket is oval shaped, stands 10 $\frac{3}{4}$ in. high, and rests on a pair of short, sturdy legs. It will not dent or rust; neither will it scratch furniture or floor. The material resists moisture, foods, and most chemicals, and the basket can be easily washed right in the kitchen sink. Because of its seamless, one-piece construction, it is impossible for liquids to leak through the base.

The same metal mold which is used for the polyethylene waste basket is also used for the production of a similarly-styled high-impact styrene waste basket. For the polyethylene model, an open pattern designed to lend added distinctiveness to the basket is cut with a punch press into the sides of the basket near the top. For the high-impact styrene model, a reinforcing top section—molded separately of high-impact styrene—is bonded to the rim of the basket to make a more durable, more attractive unit.

For kitchen applications or for a laboratory or doctor's office, Loma also markets a larger, conventional shaped round polyethylene waste basket. This model stands 12 $\frac{1}{2}$ in.

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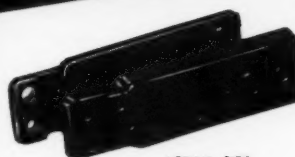
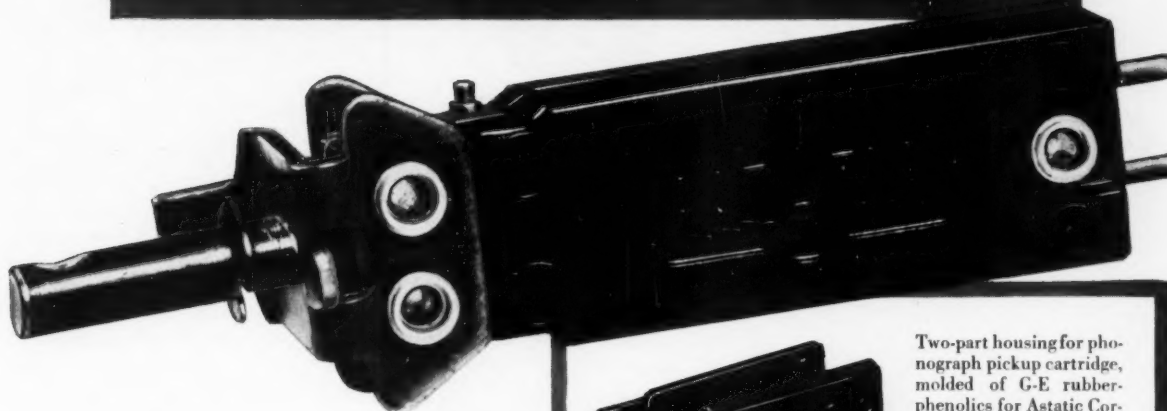
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ACTUAL SIZE

Two-part housing for phonograph pickup cartridge, molded of G-E rubber-phenolics for Astatic Corporation, Conneaut, Ohio, by Applied Plastics Division, Keystone Brass Works, Inc., Erie, Pa.

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When *conventional* phenolics were used for this phonograph pickup cartridge housing, cracking occurred when the halves were riveted together. Pressure from the tightly-packed electrical components under the riveting operation resulted in a serious assembly problem for its manufacturer.

Then a switch was made to General Electric rubber-phenolic compounds—in this case, an economical, woodflour-filled grade—G-E 12487. Result: NO MORE CRACKING—thanks to the inherent resilience of this *shock-resistant* molding compound.

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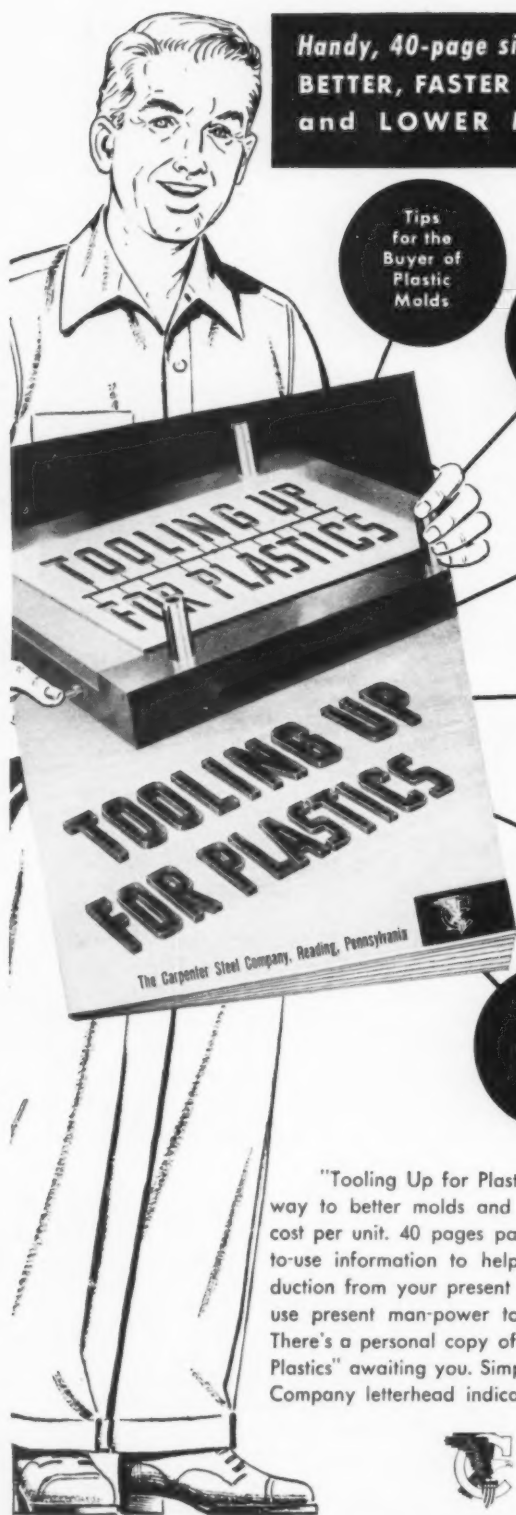
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The Carpenter Steel Co., 112 W. Bern St., Reading, Pa.
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high and has a capacity of about 17 quarts. Both polyethylene baskets are available in an assortment of pastel colors.

Wash Basin

Beacon is another manufacturer that makes use of single molds to produce housewares articles in both polyethylene and high-impact styrene. The customer is thus given a choice of the same quality item in two different materials and can make her selection according to the specific properties she wants.

Beacon, for example, makes both a high-impact styrene and a polyethylene wash basin for use in washing clothes or dishes or for preparing or storing foods in large quantities. Despite their size—both the rigid styrene basin and the flexible polyethylene basin stand 4¼ in. high and are 13¾ in. in diameter—the two basins are light in weight and easy to handle. The polyethylene model, one of the largest polyethylene applications in the housewares field, weighs less than one pound. Both plastics basins are also durable, chip-proof, and rustproof and are supplied with a hanging hole die cut into the rim.

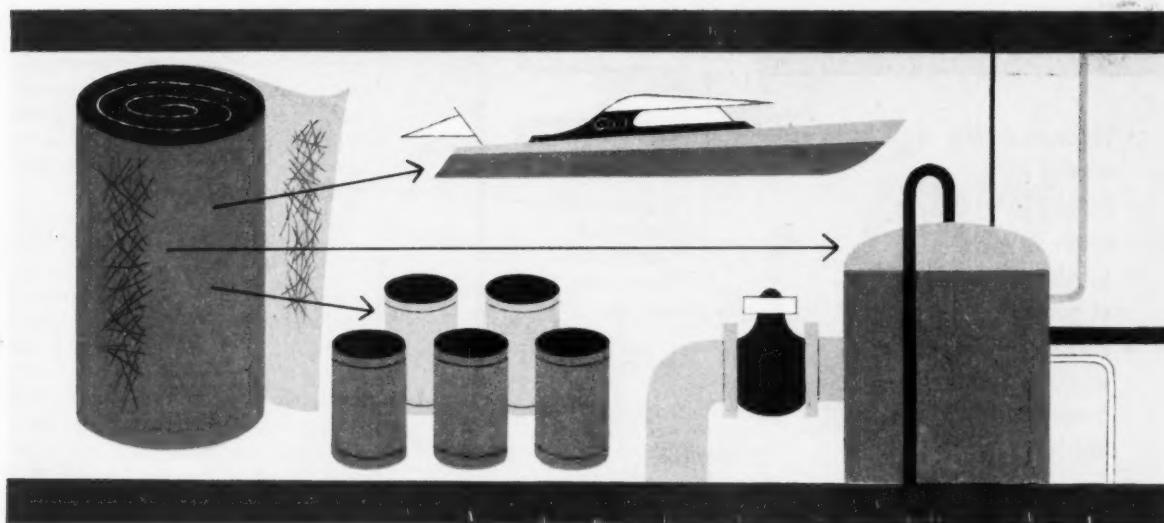
A molded one-piece sink strainer is similarly made available by Beacon in either polyethylene or high-impact styrene.

Combining Plastics

Another trend that has made itself strongly evident in the housewares field is increasing emphasis on the selection of the right plastics material to perform a specific job. In many instances, this has meant that two or more materials have been successfully combined in a single application.

Described above were styrene refrigerator dishes which used polyethylene lids for an air-tight seal. Another application in which styrene and polyethylene are happily wed is a bread box molded by The Plas-Tex Corp., Los Angeles, Calif. The housing is molded of styrene, supplied by Dow. The decorative medallion which is secured to the front of the drop-type door of the box is molded of polyethylene, supplied by Bakelite. The flexible polyethylene medallion also functions as a bumper to reduce the possibility of breakage when the door is opened. Necessary ventilation holes are

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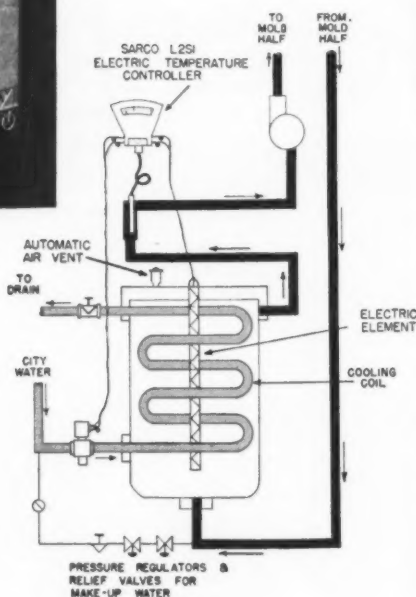


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molded into the medallion as part of the decorative pattern.

A new butter dish marketed by Alladin has a tray molded of high-impact styrene supplied by Monsanto and a cover molded of polyethylene. According to Alladin, "since the tray had to be rigid, durable, and resistant to crazing or growing brittle under very cold temperatures, high-impact styrene was selected for this application. At the same time, on the basis of past experience which showed that the cover of a butter dish was usually the first part to crack, flexible, unbreakable polyethylene was chosen for molding the lid."

More Polyethylene

As this survey makes obvious, if one had to select the most dominant trend in the plastics housewares industry, it would undoubtedly be the growing use of polyethylene. This does not mean, of course, that there has been any noticeable decrease in the importance of housewares as a market for other plastics materials, but rather that the unusual properties of polyethylene are opening new possibilities that were previously closed to any extensive use of plastics materials.

Plastray, for one, offers several new items in polyethylene that have attracted the attention of the housewife. One of these is a measuring cup, molded of Bakelite's polyethylene, which bounces if dropped and is pliable enough to be squeezed into a mixing bowl for storage. Light in weight and translucent for easy handling and measuring, the cup has a capacity of 16 ounces. Liquids flow easily over the pouring lip of the cup without sticking or dripping. Calibrations are printed in red on two sides of the cup.

Plastray also markets an all-polyethylene refrigerator pitcher with an ingeniously hinged cover. This hinge consists simply of a straight bar on the cover which slides into a slot molded into the pitcher just above the handle. When the pitcher is being used on the table, the cover can be easily removed.

From Alladin comes a polyethylene hamburger mold for shaping ground meat into a neat, attractive, and uniform patty. The one-piece unit consists of two circular halves—the top and bottom of the mold—joined by a thin strip of polyethylene

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which serves as an integral reversible hinge. Depressions for forming a large dinner-size patty are molded into one face of the two circular halves and depressions for forming a small sandwich-size patty are molded into the other. When the hamburger mold is in use, the housewife simply packs the bottom half of the mold with meat and closes the top half over it. The mold is then opened and the shaped patty is "popped out" by thumb pressure. Because of the texture of the polyethylene, it is unnecessary to line the mold with waxed paper, as has to be done with wooden molds to prevent the meat from sticking.

Among other polyethylene innovations are a silverware tray and a gadget tray, both molded of Bakelite's polyethylene by Plas-Tex. The trays are molded in one piece with separated compartments for neat storage. Both trays are also designed to fit in any standard kitchen drawer, are non-corrosive, easy to clean, and won't chip, crack, dent, or break.

One advantage of the flexible polyethylene trays that has proved especially appealing to the housewife is the fact that there is no annoying clattering and clanking as utensils are dropped into them.

Bigger and Better

The importance of good plastics housewares to the plastics industry cannot be over-emphasized. Since housewares constitute the one group of plastics applications with which the housewife has the closest contact, the chances are that the reputation of all plastics will stand or fall on her success with them.

The job being done by the plastics housewares manufacturers can well be summed up in the words of a citation recently received by Plastray from the Institute of Contemporary Art, Boston, Mass. In choosing this company's polyethylene measuring cup—described above—as an outstanding housewares item, the selection committee cited the article for its "aesthetic appeal, appropriate function, inventiveness, and economy"—the four basic advantages which the use of plastics offers to the design of a housewares item and the four basic reasons why plastics can look forward to a long and happy association with the housewares field.—END

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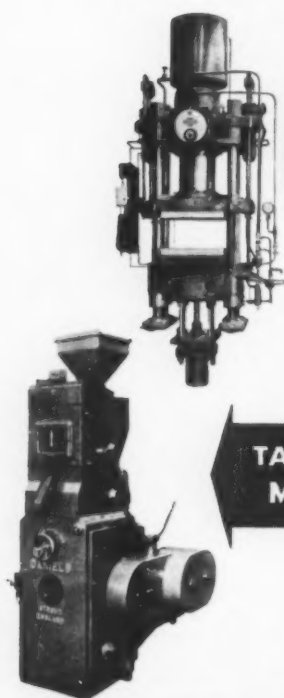
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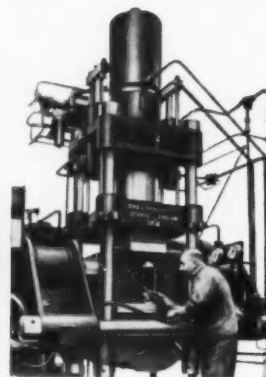
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Modern Plastics

Refrigerator

(From page 145)

or filling. A molded nylon valve mechanism is incorporated in the tap, which shuts off automatically when pressure on the control lever is released. The back of the water tank has a clear transparent window through which the water level can be seen.

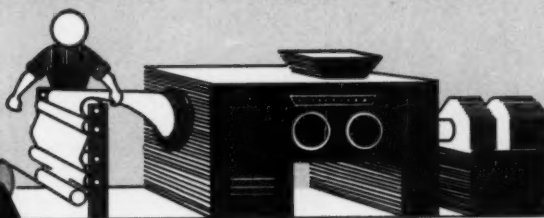
Molded Nylon Rollers

The door storage idea, which was pioneered by Crosley, has been carried to a new peak of development in the 1954 models with shelves of increased depth and the incorporation of integral storage compartments for such foods as butter, cheese, and eggs. Roll-out shelves which glide on molded nylon rollers add further convenience to the new Crosley refrigerators. Coupled with 18 linear ft. of fully recessed styrene door shelves, this arrangement puts 89% of the fresh food supply stored in the refrigerator within easy reach of the busy homemaker.

Two other new Crosley refrigerator features, made possible by plastics materials and techniques, are a blown polyethylene beverage bottle which holds and dispenses three pints of liquid and a special coffee keeper which maintains the freshness of ground coffee longer through refrigeration. Molded of styrene, Crosley's new coffee keeper eliminates waste by means of a pushbutton control which delivers accurately measured tablespoonfuls of coffee directly into the coffee maker. The device contains a small vial of blue silica gel crystals which absorb moisture and keep the coffee fresh. When the crystals have been saturated with moisture they turn pink, but an hour in a 400° oven restores their blue color as well as their ability to absorb moisture and resume their freshness-preserving function.

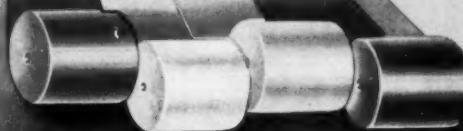
These conveniences of today's modern mechanical refrigeration may seem centuries removed from the wooden iceboxes of only a generation or less ago. They have reached their peak of perfection through plastics; tomorrow's refrigerators will carry the development of new applications of plastics to even greater heights.—END

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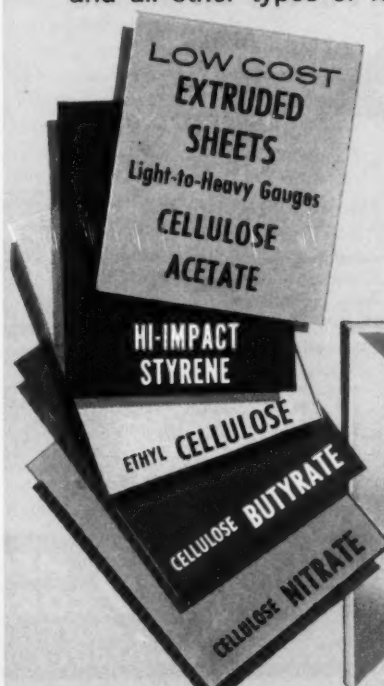
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and all other types of forming, printing,

silk screening and

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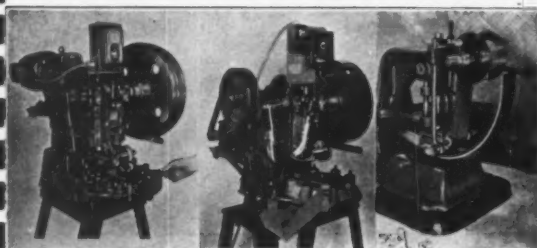
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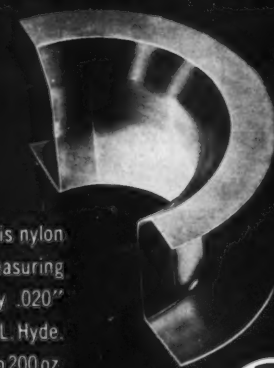


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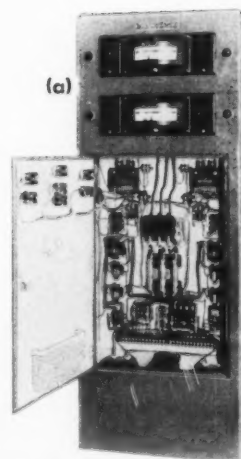
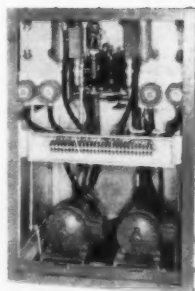


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A complex phthalate combining the advantages of polymeric and monomeric plasticizers.

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Viscosity, cps. at 0°C	193,000
21°C	3,800
70°C	74
Cloud Point	Below -92°F
Specific Gravity, 30/30°C	1.04
Refractive Index, 30°C	1.498

Graded EXCELLENT for

Solvent action and compatibility.

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Diffusion, heat, water and soap resistance.

Electrical properties.

Some suggested applications:

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Clean and Handy

(From page 179)

than the article which is contained in them.

Still another application is a washing machine cover with a quilted vinyl top and clear vinyl skirt or bottom. There are six different sizes so designed that at least one of them will fit practically any washing machine on the market.

High Standards

Thickness of film is by no means the only high standard employed by this fabricator. Technicians in the company's plant at Fall River, Mass., are constantly at work improving the products. New jigs and dies that permit faster and better construction are always under consideration. Better binding to prevent pull-outs, improved heat sealing, altered sewing machines, and more experience in using them, all contribute to a finer product at reasonable cost.

Improved zippers and methods for fastening them to the vinyl film have immeasurably increased the acceptance of the finished products. All kinds of materials are constantly under test. Even a coated nylon fabric that was made waterproof has been investigated, but Seal Sac sticks closely to the highest quality vinyl for its products because of the belief that only the best film will give dependable service.

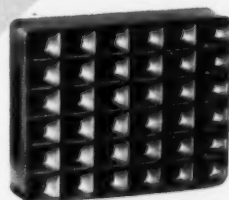
Company officials are inclined to believe that one of the most important improvements in film over the years has been the elimination of odor. Smelly bags in the food department of a home would be disqualified immediately.

Film can also be plasticized so that its stiffness at low temperatures is less troublesome. And the inherent strength in vinyl film is, of course, a major reason why Seal Sac finds it particularly fitting for its line of products. But even with that native strength, the company insists on relatively thick film to insure against the type of customer complaints that arise from flimsy, poorly fabricated items that will fail under normal kitchen treatment.

CREDITS: Film used by Seal Sac in all applications described above is Koroseal, supplied by B. F. Goodrich Co., Plastics Div., except the clear film in one style toaster cover, which is supplied by Bakelite Co.

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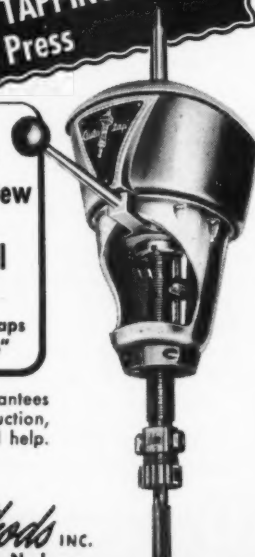
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▶▶▶ LEAD SCREW TAPPING HEADS and ATTACHMENTS ▶▶▶



Redecoration

(From page 165)

The product itself had to be right before it was permitted to move into distribution channels. And despite Bolta's long experience with vinyl upholstery materials, the company learned that a plastic wall covering posed some unique problems. At the outset, it was found that good upholstery materials do not necessarily make good wall coverings.

This was largely a matter of dimensional stability. Plasticizer blends developed for Boltaflex and Nylonized Boltaflex would not meet the requirements for Bolta-Wall and Bolta Wall-Tile. After extensive testing, a formulation was found which yielded the desired results. Plasticizer migration and volatility of the Bolta wall coverings are apparently zero, for there is no loss of weight even when held at 150° F. for 30 days. Seam contraction under test conditions was found to be negligible. Such related problems as fade resistance, stain resistance, scuff resistance, and resistance to sulfide staining also had to be met and overcome prior to the introduction of the material to the public.

Aggressive merchandising has also played an important part in building acceptance of these products. Leading consumer publications are used to bring advertising to the public, and trade journals to cover the architectural and institutional fields.

Dealers handling Bolta-Wall and Bolta Wall-Tile have available to them one of the most complete kits of colorful merchandising materials in the industry to assist them in setting up their own displays. The kits include such sales aids as full color window streamers, give-away leaflets, posters, radio scripts, and news releases for their local stations and newspapers. Many of the Bolta dealers and distributors are exhibiting the do-it-yourself wall tile at the numerous home shows and similar exhibits across the country. One of the most powerful sales aids in reaching this expanding market is a colorful store display unit which contains packages of the tile, tool kits, adhesives, and other installation accessories. A Bolta Wall-Tile instruction folder is also provided to dealers for give-away with the consumer's purchase.—END

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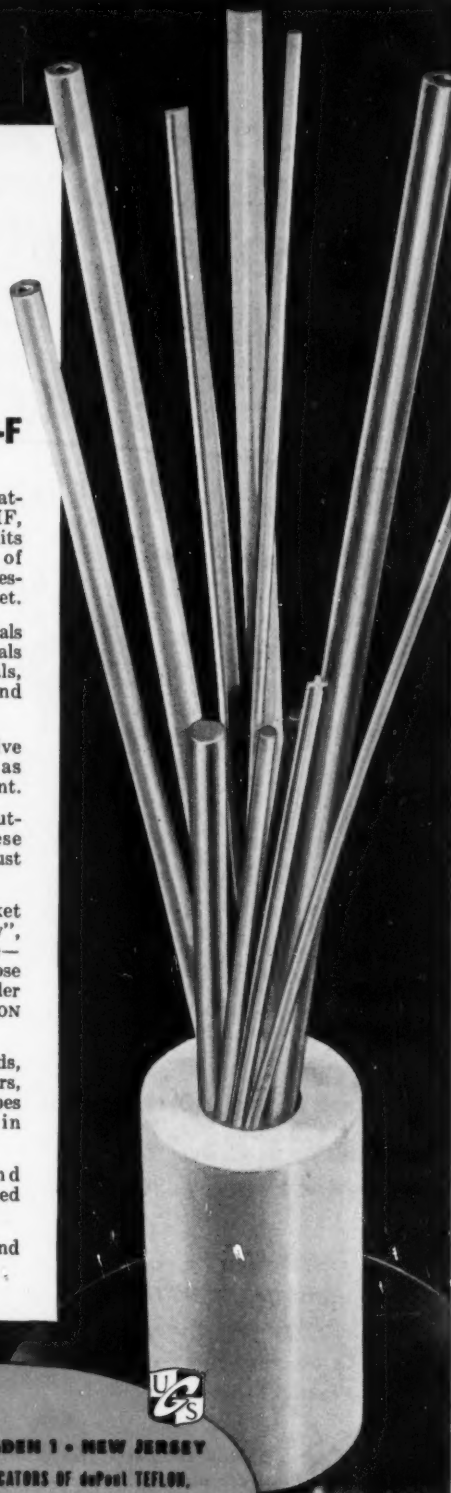
But to gain all their outstanding advantages, these materials must be handled "just right" in their fabrication.

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Challenge

(From page 150)

tough polyester film, it can withstand wind and rain or the impact of occasionally crashing to the ground without tearing. The attractive silver-metallized kite can also be rolled into a small package for storage or transportation and unrolled without damage.

In addition to its toughness, the light weight and flexibility of the polyester film contributes to the kite's flying qualities. The kite was designed by F. M. Rogallo, an aeronautical engineer, to adjust its flexible shape to counteract changes in the velocity and direction of the wind. It can thus be easily controlled with its nylon line to do loops, figure eights, and other intricate maneuvers.

A fabricated vinyl "wind sock," attached to one end of the kite in place of the conventional tail, also adds to the kite's maneuverability.

Polyethylene Toys

As so many leaders in the industry predicted, just as soon as more polyethylene became available last year and this, the toy manufacturers began to take the wraps off a variety of new applications molded of polyethylene.

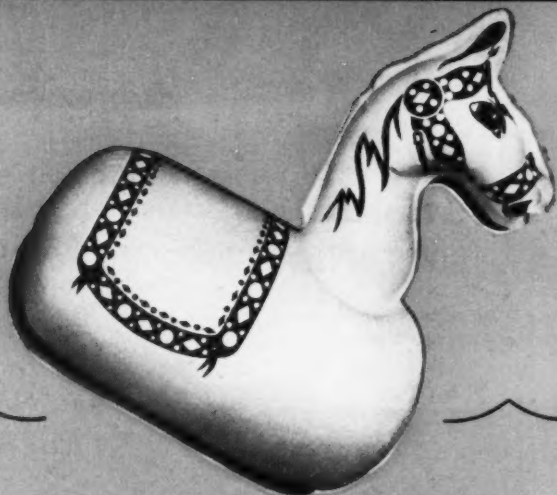
The polyethylene toy has many advantages in its favor. Its pleasant feel and flexibility have a basic appeal for the child. And a polyethylene toy can be used with perfect safety. It is non-toxic (in the event the child puts the toy in his mouth), it will not break, and there are no sharp edges that can harm the child.

With these advantages in mind, Nosco Plastics, Erie, Pa., put on the market at the end of last year a polyethylene fire truck, attractively and realistically molded in bright red.

The truck body is molded in one piece that includes fenders, running board, windshield, seats, headlights, and other intricate details. A two-piece polyethylene ladder that swivels up and down is molded separately and snap-fitted into an opening on top of the truck cab so that it can rotate in any direction. Molded polyethylene firemen models, in various standing and sitting positions, are also available for the child to insert into key-shaped holes pro-

(To page 312)

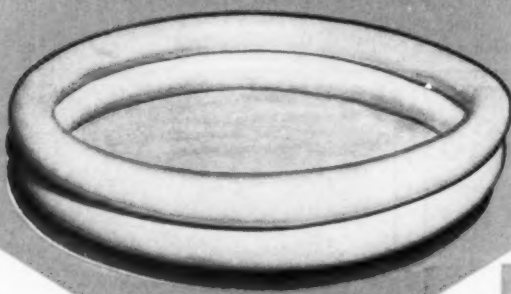
Modern Plastics



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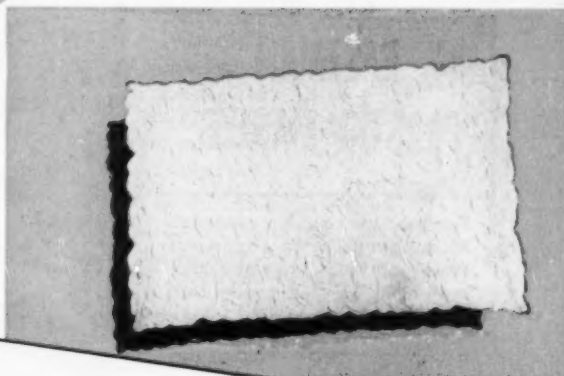
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Here's a closeup of the top radome, composed of Hexcel Glass Fabric-Plastic Honeycomb in 1/4" cell size, faced with glass fabric skins.

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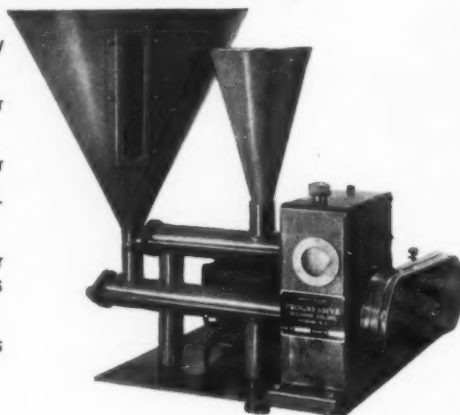
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A-2 Adhesive (Off-White). Has somewhat better electrical resistance properties than other grades. Because of its color this adhesive is used quite extensively in bonding ceramics.

A-3 Adhesive (Black). Has properties similar to the A-1. It can be used in place of the A-1 where the black color is desired.

A-4 Adhesive (Aluminum Gray). Somewhat heavier in viscosity and has greater tackiness than the above grades. Ideal for use on vertical surfaces where less viscous materials might tend to run. Tensile shear strength same as A-1.

A-6 Adhesive (Dark Gray). This formulation was designed primarily for bonding aluminum and is recommended for use on copper and copper alloys.



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vided for them along the running board and rear seats.

To add extra play value to the toy, a metal friction motor is fastened to a series of lugs molded into the undercarriage of the truck body.

Another appealing toy which takes advantage of the properties of polyethylene is a three-car "tote-train" that the child can fill with candy, blocks, or balls and easily pull behind him. The three cars—one in red, one in yellow, and one in blue—are joined together by a simple interlocking arrangement in which a hook molded into one end of the car fits into a hole molded into a tab on the car in front of it. Since polyethylene floats, the tote train can also double as a bathtub toy.

Vinyl Blocks

The "unbreakable" theme in flexible toys is also carried out in a set of vinyl blocks which Jolly Blinker Co., Inc., New York, N. Y., added to the diversified line of plastics toys in 1954.

The set consists of six blocks slush molded in assorted colors of vinyl plastisol. The blocks are non-toxic, washable, and completely safe for even the youngest child.

Raised illustrations of animals and flowers are molded into all six sides of each block and a hollow air chamber is molded into the center of each. When the child squeezes the soft toy, the escaping air creates a delightful whistling noise.

Each block also has a molded-in tab with a large hole which permits the blocks to be strung together. To complete the all-plastics set, two feet of extruded vinyl string are supplied with each series of blocks.

Styrene Gun

As distinguished from the flexible polyethylene and vinyl toys, rigid plastics playthings have been dominated in recent years by a trend towards improved, functional design. By building in thick wall struts and by applying a tough plastic material where toughness is called for, manufacturers today are molding extra strength into their rigid toys.

Ideal Toy Corp., New York, N. Y., for example, is marketing a plastics cap-shooting atomic machine gun that combines outstanding durability with imaginative styling. The

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NOTE: The MYCALEX glass-bonded mica materials designated above, are all exclusive formulations of and manufactured only by the Mycalex Corporation of America.

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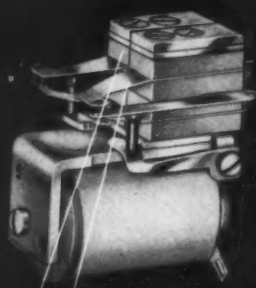
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gun, which measures 25 in. long, is available in black or mahogany mottled color and is thoroughly equipped with front and rear sights, hand rest, magazine door, insignia, and other attractive adornments.

With the exception of a single gear, which is molded of nylon for its extra toughness in movable parts, the entire gun is molded in several sections of high-impact styrene and cemented together.

To operate the gun, the child inserts a molded styrene crank into the nylon gear which is cemented into the center of the magazine of the gun. As the crank is turned and the roll of paper caps starts to unwind, a bar is periodically forced down on top of the caps, shooting them off one by one. At the same time, the barrel of the gun moves in and out simulating recoil.

From Archer Plastics, Inc., Elmhurst, N. Y., comes a molded styrene toy that combines education with play value. The toy, which is actually a miniature scale molded in three parts of high-impact styrene, is designed to teach the child to add and count. A set of 14 numbers, molded of rugged high-impact styrene in a different size for each digit, is supplied with the set. When the numbers are hung on the balance arm of the scale, the arrow indicator molded into the arm will register "correct" only when a combination of numbers on one arm equals those on the other. The combined weight of the 5 and 4 digits, for example, is exactly equal to the weight of the single molded 9 digit. Thus, when 5 and 4 are hung on one arm and 9 on another, the scale balances perfectly.

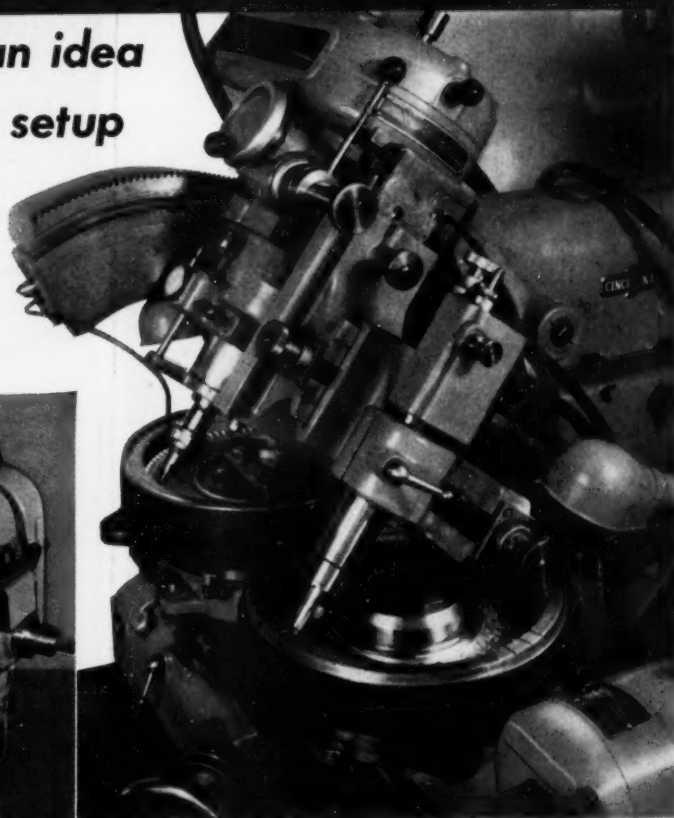
Urea Bricks

Halsam Products Co., Chicago, Ill., makes use of three different plastics materials—urea, styrene, and cellulose acetate butyrate—in its American Plastics Bricks building set. Each set contains a supply of red brick units—molded with a patented peg-and-socket construction that permits the pieces to interlock perfectly—as well as model parts for forming picture windows, shutters, overhead garage doors, and similar building components. By assembling all these pieces in various combinations, the child is able to build many attractive types and styles of homes.

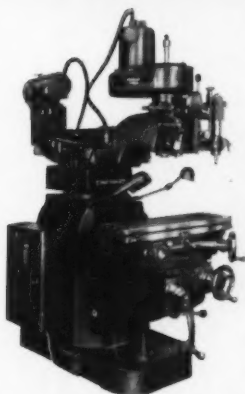
The red brick units, which com-
(To page 319)

Ideas are where you find them

*...and you may find an idea
in this rubber mold setup*



Milling the tread in a tire mold. The machine is a CINCINNATI 8" x 18" Tool and Die Miller, equipped with a power driven Duplex Rotary Table Attachment for completely automatic duplication of many complex shapes and intricate details with no more than casual attention from the operator.



CINCINNATI 8" x 18" Tool and Die Milling Machine. Brief specs. in Sweet's Machine Tool Catalog. Complete information in catalog No. M-1731.

Notice how the cutter spindle and tracing heads of this CINCINNATI 8"x18" Tool and Die Miller are swiveled to the most advantageous tracing and cutting position. The head can be swiveled right and left, forward and back, around a pivot approximately at the end of the cutter. Does this give you an idea? Notice the extra large cutting range evident from this setup; it's actually 8"x18" in one setting. Does this give you an idea? Notice the power driven Duplex Rotary Table Attachment; it rotates the master and work

(mold) at the same speed under the cutter and tracing finger. Does this give you an idea? There are many exclusive advantages of the CINCINNATI 8"x18" Tool and Die Miller that you can translate into profitable ideas for producing plastic molds, and for contract tool and die work. Brief data on these machines will be found in Sweet's Machine Tool Catalog; complete information may be obtained by writing for catalog No. M-1731.

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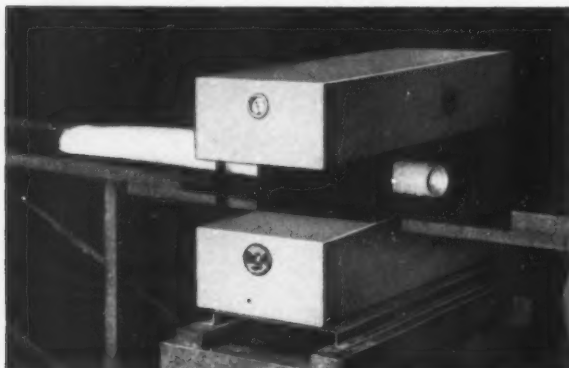
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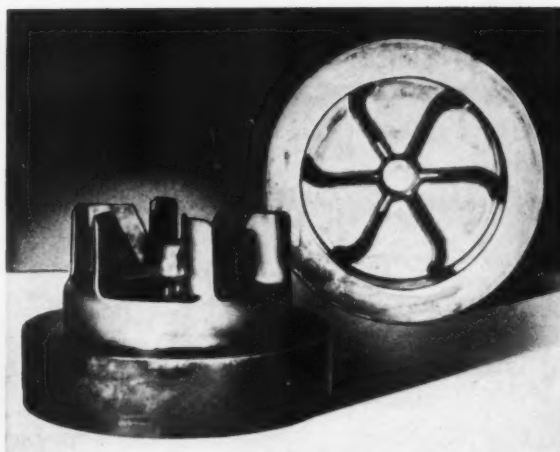
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Hob diameter	8 1/2"
Blade height	2.813"
Blade thickness	(top) .062"
Blade thickness	(bottom) .093"
Number of castings required	4
Number of castings supplied	4

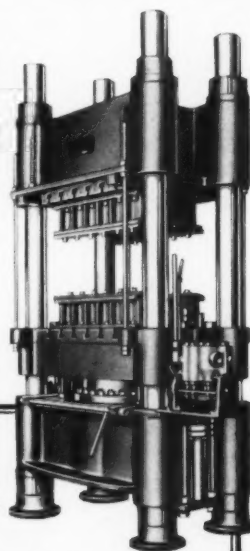
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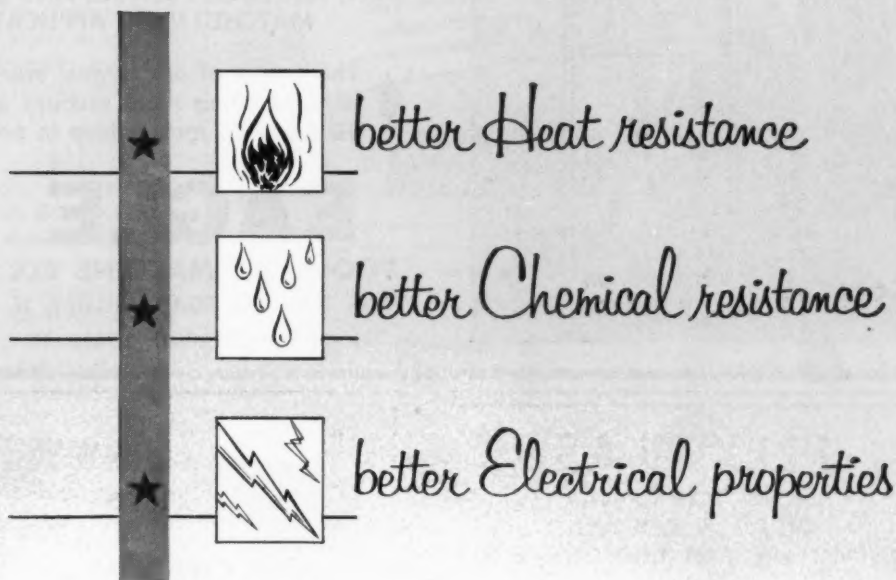
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Curing Agent CL is Shell Chemical Corporation's name for metaphenylene diamine. We do not manufacture Curing Agent CL. It is available in commercial quantities from E. I. du Pont de Nemours & Company and National Aniline Division, Allied Chemical & Dye Corp.

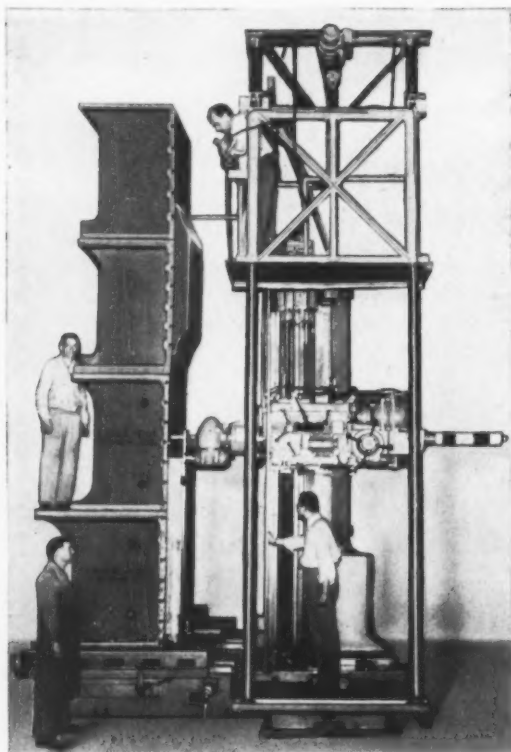
* A development of Shell Chemical laboratories. Patent applied for.

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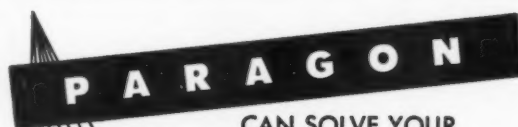
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prise 80% of the parts in the set, are molded of urea. In selecting urea for this application, the manufacturer states that he was influenced "by the economy in manufacture made possible by fast production cycles, by the dimensional stability of urea which prevents the close-fitting parts from warping, and by the clean-cut appearance of the finished molded brick." In addition, the urea parts will not fade, are unaffected by weather, and can easily be washed.

Since the other parts of the set required more flexibility in the very light rib sections than was possible with urea, the lintels, copings, and garage doors were injection molded of high-impact styrene and the hinged doors and windows were injection molded butyrate.

Mother's Helper

One of the major contributions of plastics to the toy field has been in giving added interest, improved appearance, and extra play value to toys that use wooden or metal parts.

An excellent illustration of this is the Junior Doll-E-Sweeper introduced by American Metal Specialties Corp., Hatboro, Pa. Since authenticity is the keynote in the design of this miniature carpet sweeper—it actually works—the unit is housed in a molded one-piece styrene case that exactly duplicates the streamlined shape and color of the full-size sweeper. The case is molded with an integral grained walnut finish that cannot chip, peel, or fade and can easily be wiped clean with a damp cloth. Extra-thick wall sections are molded into the unit to give it added durability. So efficient is the toy that, after daughter has finished playing "house" with the sweeper, Mother can use it for little "clean-up" jobs.

Underneath the housing are two partitions, also molded of styrene, which are designed to keep the steel dust pan, the revolving brush, and the other working parts of the sweeper in place. These two partitions slide into slots molded-in the underside of the housing and can easily be pulled out when the dust pans need emptying.

Another toy application that acquires added sales appeal with the introduction of plastics parts is Timmie the Musical Turtle, a pull-toy product of Fisher-Price Toys,

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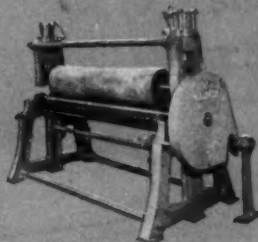
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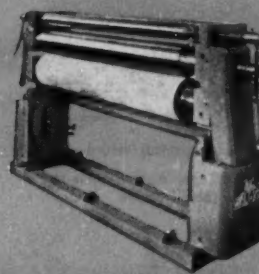
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Inc., East Aurora, N. Y. The entire shell for the turtle toy is molded of cellulose acetate in lustrous, easy-to-wash green. The shell is so strong that it will support the weight of the average adult . . . or the muscles and destructive instinct of the three-year-old. The bobbing head and moving legs of the turtle are wood and inside the shell is a music box that plays when the toy is pulled across the floor.

"Do-It-Yourself"

A major emphasis in the toy field in recent years has been on "do-it-yourself" play applications with realistic miniatures of vehicles, tools, home furnishings, and other familiar products of everyday life. Since a wealth of intricate detail to satisfy this insatiable appetite for realism can be effectively molded into plastics toys, plastics have captured over half of these applications.

Perhaps the biggest in volume among this percentage are the construction kits that can be assembled into models of modern and old-fashioned automobiles. Ideal Toy Corp. markets such a series of kits, featuring six of the great names in the sports car world—Jaguar, Ferrari, Pegaso, Mercedes-Benz, Rolls-Royce, and the Corvette.

Except for the more elaborate Corvette, each of the kits consists of four molded vinyl wheels and 31 molded styrene body parts, including chassis, body, radiator, grille, engine, and hood. The parts are assembled with screws instead of glue to enable the ambitious youngster to dismantle and reconstruct each realistically detailed model.

The 16-in. Corvette model is patterned after Chevrolet's famous reinforced plastics sports car, and highlights the trim interior fittings and accessories of the original. In addition to five molded vinyl tires, there are 56 styrene parts including a removable clear top and headlights that actually work on a battery.

Nosco Plastics, Erie, Pa., markets another type of "build-it-yourself" kit, making use of clear and colored cellulose acetate parts. When completely assembled by cementing and snap-fitting the various parts together, the finished model is a colorful replica of an authentic farm tractor with visible moving piston action.

Brother to the "do-it-yourself" applications are the "fix-it-yourself"

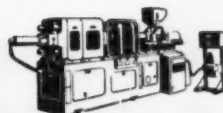
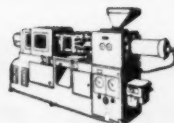
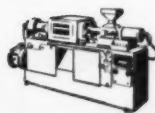
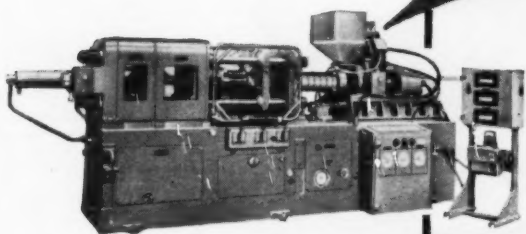
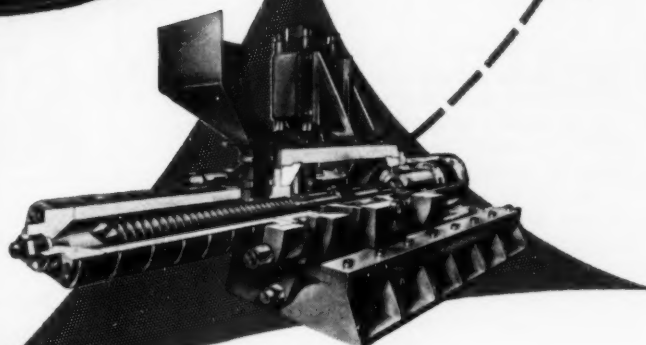
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The 2044 AUTOPLAS with an injection capacity of 44 cub. ins. (1.1 A.) has the well known long toggle mechanism exerting 350 tons pressure. This new model retains the old features of the previous injection moulding machine such as, platen area 29" x 25" and 25 h.p. motor drive, whilst giving a trebled capacity.

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toys which supply the child with detailed replicas of various repair tools and a vehicle with removable parts that he can play at fixing.

Ideal Toy Corp. uses this principle in the design of their old-fashioned stagecoach model set. Nearly every major part of the stagecoach is movable or changeable.

The driver of the stage coach, the whip he uses, and a joining button in the whiffletree are all molded of flexible vinyl. The harness is extruded vinyl and the rest of the coach is molded of high-impact styrene.

The line of toy instruments being produced by Emenee Industries, New York, N. Y., is also typical of the high degree of realism which plastics make possible. Each of the instruments in the series—a golden trombone, a silver saxophone, and an ebony and silver clarinet—is accurately molded to reproduce the originals in exact detail and is constructed so that the child can play real tunes on them. After molding, each toy is vacuum metallized in the proper color and authentically engraved.

While all the toys described above are obviously only a sampling of the thousands of plastics toys on the market today, their quality is symbolic of the overall quality of the industry and their popularity points up the reason why the toy field will continue to serve as a major market for plastics materials.

CREDITS: (In the order in which they are mentioned.) Inland car is molded by American Plastics Corp., Bainbridge, N. Y., using fibrous glass supplied by Owens-Corning Fiberglas Corp. Hedstrom car is molded by Norman Parke Co., Chicopee, Mass., using fibrous glass supplied by Owens-Corning Fiberglas Corp., and Marco polyester resin supplied by Celanese Corp. of America, New York. Mylar Polyester film for Flexikite is supplied by E. I. du Pont de Nemours & Co., Inc. Machine gun is molded by Ideal Plastics Corp., N. Y., using high-impact styrene supplied by The Dow Chemical Co., and nylon supplied by E. I. du Pont de Nemours & Co., Inc. Archer counting toy is molded of high-impact styrene supplied by The Dow Chemical Co. Urea blocks for Halsam Products Co. are molded by Elgo Plastics, Inc., using material supplied by Barrett Div., Allied Chemical & Dye Corp. Acetate parts for Timmie the Turtle are molded by Trimold, Inc., Kenmore, N. Y., using Hercocel A supplied by Hercules Powder Co. Ideal stagecoach is molded by Ideal Plastics Corp. using high-impact styrene supplied by The Dow Chemical Co. and vinyl supplied by The Dow Chemical Co. and Bakelite Co. Emenee toy instruments use styrene supplied by Bakelite Co.

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Here you see the extruder with individual features identified. This redesigned N. E. Extruder is available in 2½", 3½" and 4½" sizes. The degassing section is optional.

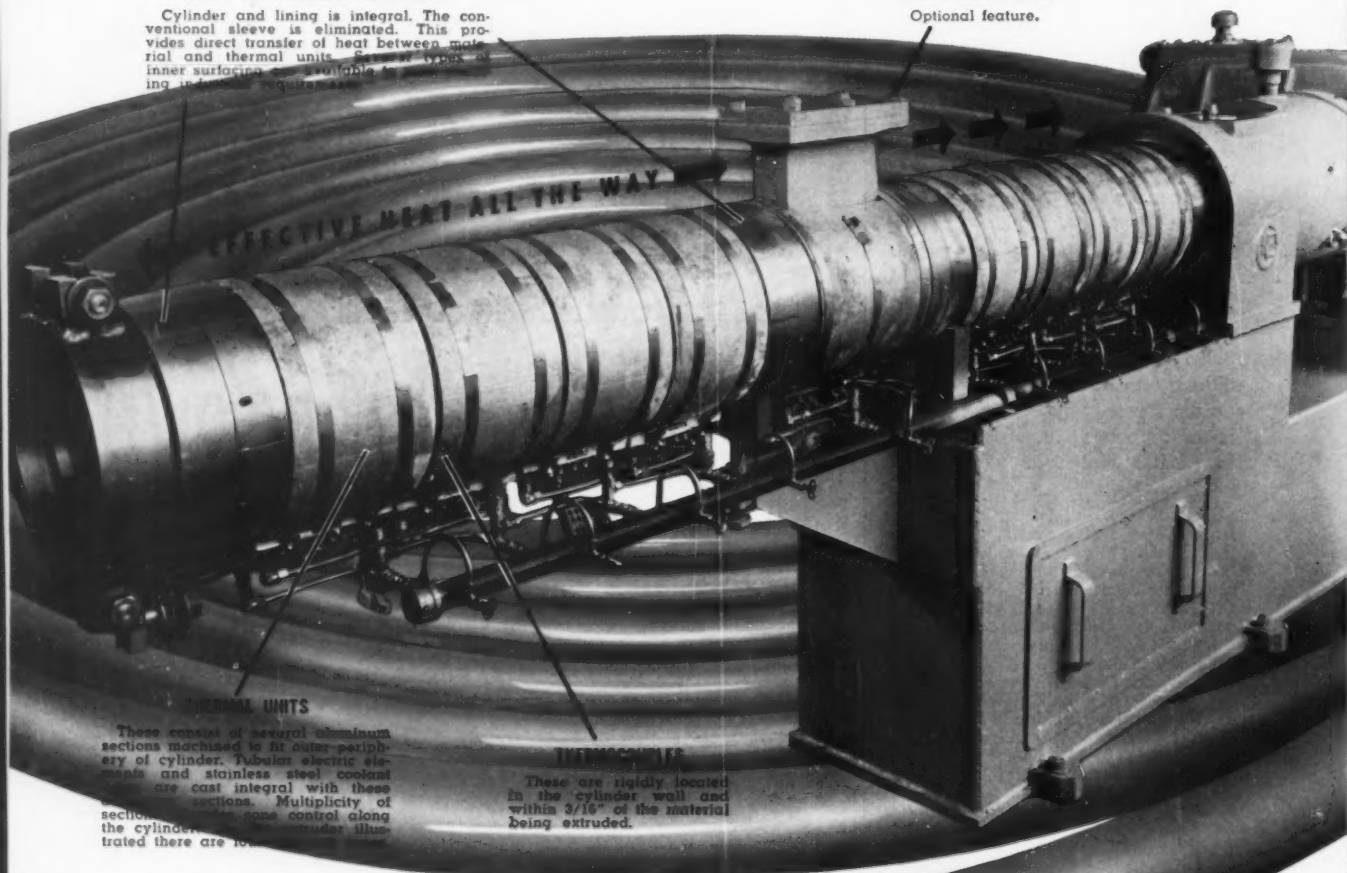
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These are rigidly located in the cylinder wall and within 3/16" of the material being extruded.

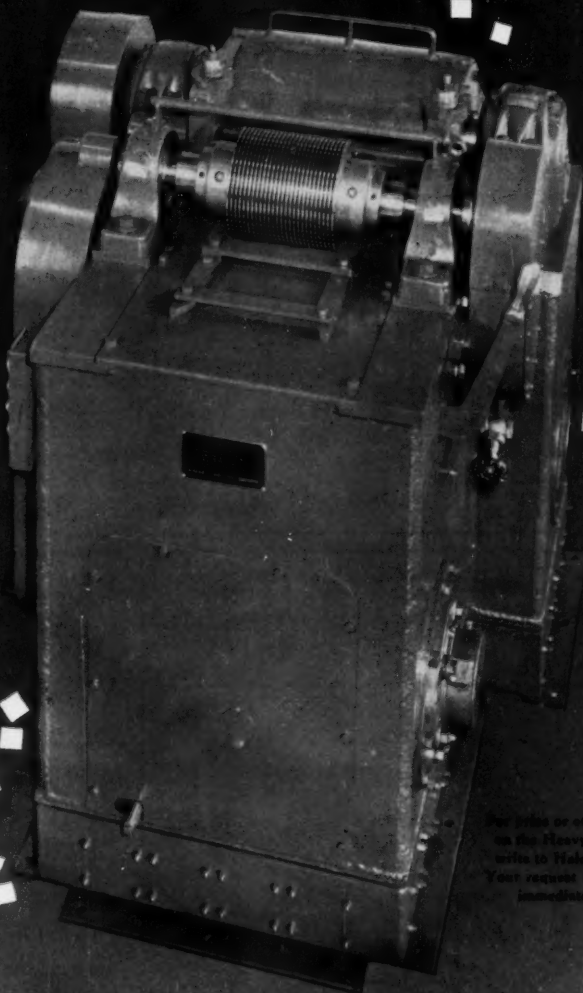
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Light

(From page 136)

center of the diffuser to accommodate the socket and upper half of the lamp stand. Since the size of these two parts varies in many cases, the mold cavities for the diffusers have removable center plugs for molding various diameter holes. The sizes of these holes vary from about 1¼ in. for a single socket to approximately 5 in. for a triple socket lamp.

The diffusers are gasketed at the edges to reduce imperfections on the surface to an absolute minimum.

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Unlike conventional fabric or paper shades, the laminates are durable, will resist tearing, fading, warping, shrinking, and scuffing, are unaffected by moisture, mildew, mold, grease, and most chemicals, and are easy to clean by wiping with a damp cloth.

By mounting the shades on a vinyl-coated wire frame, Lightolier obtains still another advantage. Conventional shades previously had to be glued to the wire frame. Under the heat of the light bulb, the glue would eventually dry out, shortening the life of the shade. By dielectrically sealing the laminate to the vinyl-coated frame, however, Lightolier assures a longer, more dependable service life for its line of laminate shades.

New Materials

Taking into consideration these outstanding examples from Lightolier, as well as the offerings from other leaders in the industry, the over-all picture shows that more plastics are being used by the lighting industry in more improved ap-

plications. Nor is the end yet in sight. Companies such as Lightolier are completely sold on plastics as the construction material for quality lighting fixtures and tomorrow's plans call for an extended use of plastics.

Improved techniques in vacuum forming have also opened new doors. The process is currently being used by Lightolier in the production of styrene diffusers where the volume required is not too large and research is going forward on a more extensive use of the low-cost method with styrene, oriented styrene, and acrylic sheets.

Better plastics continue to be used in better ways by the lighting industry to produce a better product—a product that can win many friends for plastics among the final consumers.

CREDITS: Knob for bullet shade molded by Snow Plastics, Chicago, Ill.; bullet shade molded by Snow Plastics and Proton Plastics, Div. Prophylactic Brush Co., Florence, Mass. Visor shade molded by Molded Insulation Co., Philadelphia, Pa. Resinox 10477A general-purpose phenolic for both shades supplied by Monsanto Chemical Co., Plastics Div. Vinyl laminates supplied by Pan Laminates, Inc., New York, N.Y.

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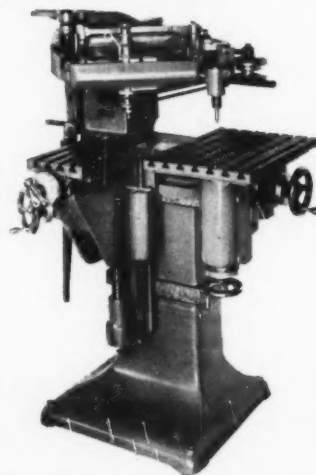
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Smaller—Better

(From page 159)

improve the tonal qualities of the radio, and to create a more attractive appearance.

The 1954 Philco portable radios represent a distinct achievement in combining the latest developments in both radio technology and plastics engineering. With the exception of metal brackets for the carrying handle, styrene is used for the entire cabinet. The handle folds into recesses, much the same as in the previous model. The handle is fastened to the case by simple metal straps that are hinged to reinforced bosses. The styrene back cover has four molded lugs which snap-fit into recesses in the front section. Six bosses with threaded metal inserts are molded-in. Divisions to hold the chassis, speaker, and battery are also molded directly into the cabinet and prevent the assembled parts from loosening.

Control Knobs

Mounting elements are all molded directly into the cabinet; insertion and tightening of screws is all that is required to complete the assembly.

The grille is a separate sheet of styrene and is decorated by vacuum metallized gold rear surface treatment and painting. All decoration is completed on the back or protected surface, making it impossible to damage the decorative effect when the set is in use. Two holes in the grille fit over molded-in bosses which are then flattened by heat and pressure to provide a permanent mounting.

Tuning and volume control knobs are also rear surface treated, first by vacuum metallizing the back surface and then spray painting the gold to intensify the color. Symbols on control knobs are hot stamped.

The weight of the cabinet used on the newest Philco portable is approximately one pound or less than one-fifth as much as the cabinet on the first 1939 model. Dimensions of the original were 7 $\frac{1}{8}$ in. high, 13 $\frac{1}{8}$ in. wide, and 7 $\frac{3}{4}$ in. deep as against 5 $\frac{1}{16}$ in. high, 9 $\frac{1}{4}$ wide, and 2 $\frac{1}{2}$ in. deep for the 1954 model.

CREDITS: Molders are Santay Corp., Chicago, Ill.; Erie Resistor Corp., Erie, Pa.; and Thermoplastics Inc., Div. of The Standard Products Co., St. Clair, Mich.

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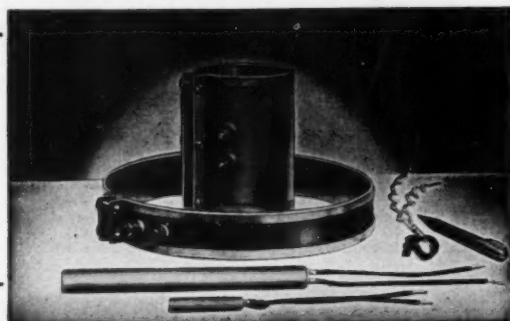
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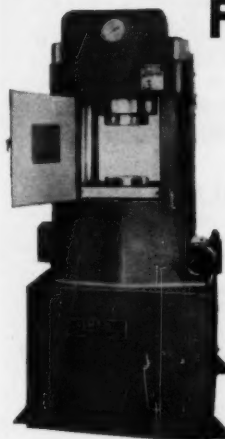
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It Clings

(From page 137)

chen shelves of the American home maker.

Following this introduction, Dow was faced with the major job of selling the film to housewives familiar only with waxed paper, metal foil, and cellophane as a household wrap.

Merchandising

Trading on the favorable attitude of the housewives toward saran, already known to them in the form of automobile seat covers, window screening, and upholstery fabrics, the first step in Dow's merchandising campaign was to tradename the material Saran Wrap.

Test market areas were set up in the Midwest in conjunction with local advertising campaigns. Based on the excellent reception to saran film in these areas, Dow then made the wrap available to grocery, hardware, drug, and department store outlets all over the country and backed up their distribution with an aggressive promotion program making use of radio and television time,

magazine and newspaper space, and point-of-sale displays.

Today, only six months since its introduction to the housewife, Saran Wrap in its attractive dispenser with a metal cutting edge has become a familiar—and looked-for—sight on grocery shelves everywhere.

Properties

The uses of Saran film are many, the possible applications limited only by the imagination. It has a high degree of transparency, it is resistant to chemicals and greases, it is tough, and it is washable and reusable.

Because of the tendency of saran film to cling to itself, it is ideal for wrapping sandwiches and other foods for lunch boxes and picnic baskets. The same characteristic permits it to be made into a tight cover for bowls or dishes by simply pressing the edges of a sheet of the film to the sides of the container.

In comparison with most other wrapping materials, saran film has a very low moisture vapor transmission rate. The life of many products wrapped in the film, including perishables such as baked goods, is thus extended over a greater period

of time than has heretofore been possible.

Another problem in household wrapping is solved by the ability of the film to keep odors in or out. Cut onions, melons, pickles, or cauliflower can now be wrapped in saran film and stored in the refrigerator without danger of transmitting odors of one food to another.

In addition to its food packaging applications, the lightweight film can be used for protecting woolen garments from moth damage, for wrapping silverware to protect it from tarnishing and keep it ready for instant use, or for wrapping soiled or damp items in a traveling case. When used in the workshop, the film is ideal for wrapping paint brushes to prevent them from drying out or to keep spackling compounds from picking up any atmospheric moisture.

As saran film continues to grow in popularity, the new applications discovered by the ingenious consumer continue to multiply, each new one attesting to the description of saran film as the plastic film of a "hundred-and-one" uses in the household.—END

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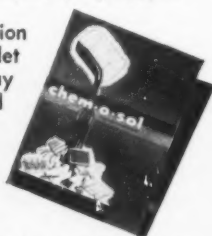
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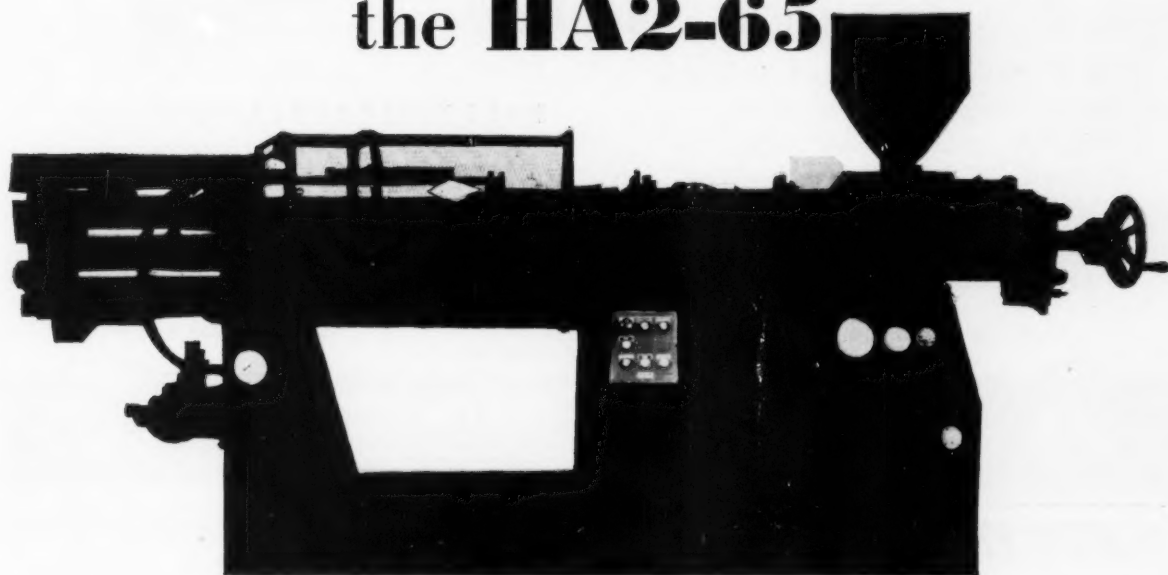
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(From page 125)

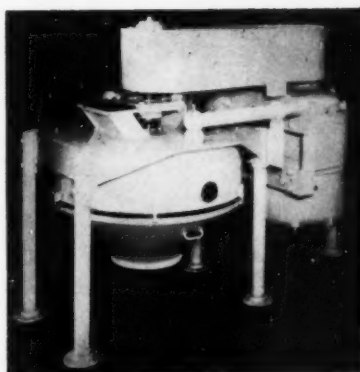
and cabinets had to expand with them. At the same time, the market was becoming intensely competitive and it was important to hold costs in line. It was in an effort to meet these problems that Admiral developed and brought out in June 1949 its historic Consolette model. It featured furniture styling and a 10-in. screen in a one-piece molded phenolic cabinet standing 32¼ in. high and weighing 35 pounds.

This triumph of the plastics molder's art could be described only in superlatives. The intricately machined and finished tool, made in seven main sections, weighed 16,000 pounds. The 2000-ton press on which the cabinet was molded was so tall that an opening and skylight had to be made in the roof of Molded Products' plant to accommodate it.

Among the design and construction features of the Consolette cabinet were an inner shelf which greatly increased the strength of the unit while providing a solid mounting platform for the chassis of the receiver, and a handsome diamond-patterned grille behind which the speaker was mounted in the final assembly. Using preforms preheated on a 15-kw. RCA preheater which raised the temperature of the material to 250° F. in 1 min., a molding cycle of approximately 6 min. was attained. The molder estimated that without preheating, the part would have required 4000 tons of pressure and a 20-min. cycle—which would, of course, have thrown costs completely out of line.

Ross D. Siragusa, president of Admiral Corp., and his brother, the late Dom Siragusa, president of Molded Products, were justifiably proud as the epochal Consolette cabinets emerged from the press, ready for the assembly line after only minor deflashing. Said Ross Siragusa: "Old conceptions of size limitations for compression-molded pieces are definitely out, now that basic principles have been established—and still only the surface has been scratched."

Largely because of the economic advantages of the phenolic cabinet as against a wooden cabinet, the 24-tube, 10-in. Consolette retailed at \$249.95, which the manufacturer



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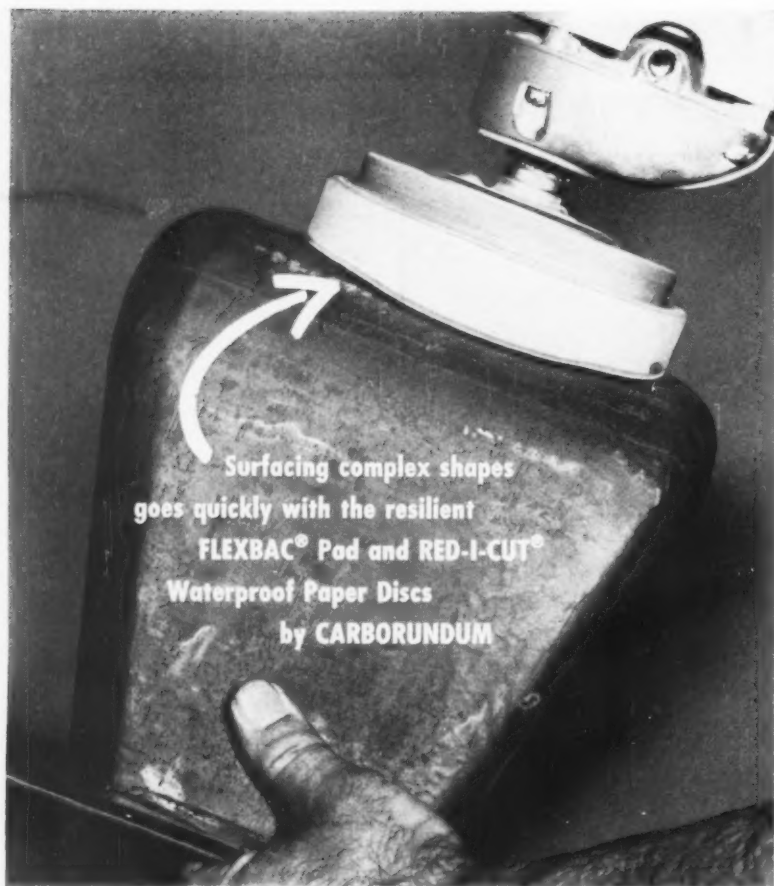
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claimed was \$100 less than any comparable set at the time. As shown by later studies, the construction and finishing of a wooden TV cabinet involves some 525 different construction operations, as against three to six operations for a molded plastic cabinet.

Duplicate Set of Tools

Following the acquisition of a new 2500-ton H-P-M press, a duplicate set of tools was constructed and Molded Products began producing two Consolette cabinets per shot on the same molding cycle. Using duplicate preheaters and working in unison, two operators preheated the phenolic preforms, placed them in the cavities and, at the end of the cycle, withdrew two identical cabinets. Again Admiral had created a new frontier in plastics molding.

The pattern had been established. The 1950 Consolette cabinet, measuring 34 in. high, 18 in. wide, and 18¼ in. deep, weighed 41 pounds. Among its design features were a speaker grille consisting of 30 square louvers and an integrally molded bezel which framed the 12-in. picture screen. Before long, this model was "twinned up" with duplicate molds in the 2500-ton press (modified to produce a gross tonnage of approximately 3000), for a fabulous total of 82 lb. of phenolic molding material per cycle. Again, thanks largely to the economies of the plastic molding process, Admiral was able to retail the set well under competition at \$199.95.

This model also included a styrene knob panel and screen window and butyrate control knobs. The screen window, another application pioneered by Admiral, simplified assembly and reduced manufacturing costs by eliminating the separate mounting mask required with a plate glass lens. The control knob panel and lens were produced by Amos Molded Plastics and the control knobs by Santay Corp. Later escutcheon masks and lens units used by Admiral on other sets ranged as large as the 19-in. window molded by Loma Plastics, Inc., which measured 19 by 22 in. and weighed 51 ounces. Molded of clear transparent styrene material, it was decorated by painting the mask area on the reverse side in gold.

As screen sizes moved up rapidly to 14, 17, 19, and 21 in., styling trends

DESIGN and PRODUCTION NEWS

FOR PLASTICS AND MATERIALS ENGINEERS

Published by TECHNICAL SERVICE, Chemical Manufacturing Division, The M. W. KELLOGG Company

JUNE - JULY, 1954

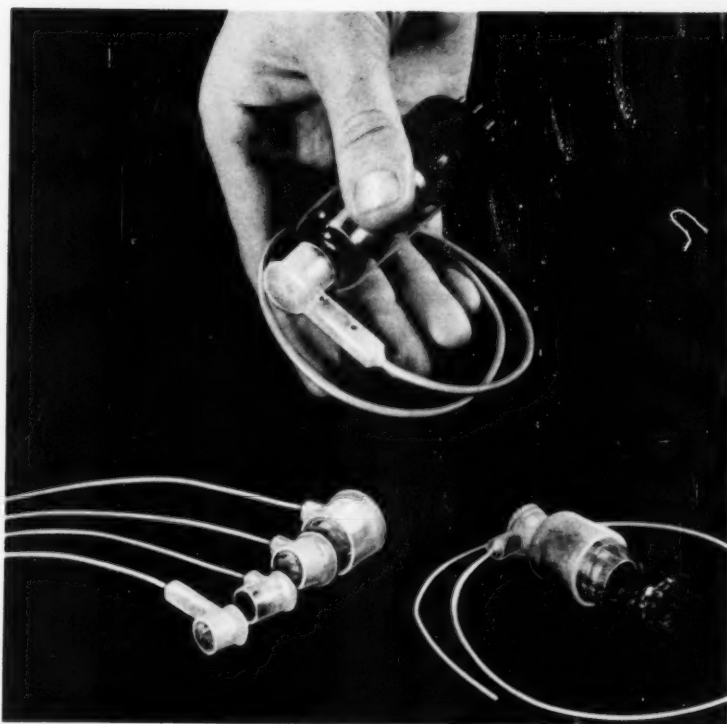
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GREASES

DESIGN and PRODUCTION NEWS

CONTINUED FROM PRECEDING PAGE

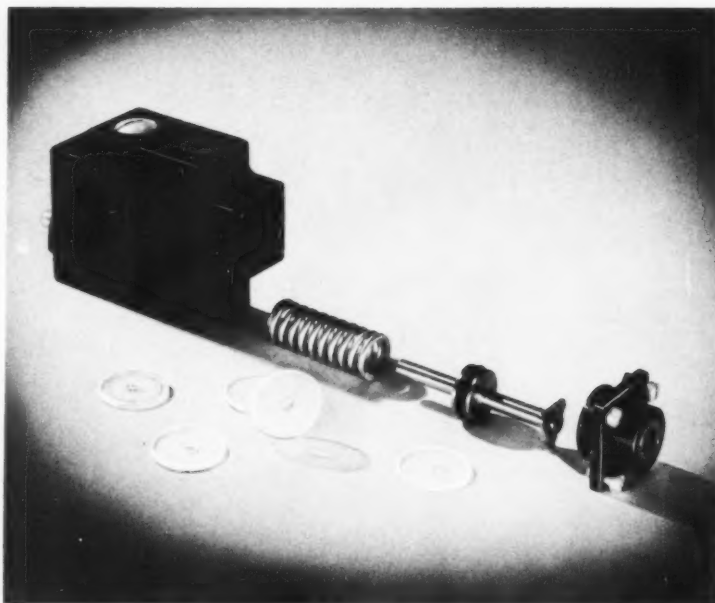
Poppet Valve-seats of KEL-F[®] Polymer Withstand High Gas Pressures, Repeated Impact in -65°F +160°F Service

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The Reiss Manufacturing Company, New York, N. Y., molds sheets of KEL-F polymer Grade 300 from which valve seats are made by Air Associates, Inc., Teterboro, N. J.

For further information ask for Application Report P-102



Molders & Fabricators of the Month

Leading molders, extruders and fabricators specialize in the production of materials and parts made of "Kel-F" ... each month this column will spotlight several of these companies with their principal services and products.

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Recent Significant KEL-F Polymer Developments...

"Lug" type pressure rupture discs now use extruded film not only to protect discs against corrosion damage, but as pressure and vacuum seals.

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Heater coils and plates for severe chemical service are protected with "baked on" coatings of KEL-F polymer dispersions.

Indexed commutators for computers now consist of a molded plastic cylinder with intricate conductive inserts. High dielectric and non-carbonization of polymer improves performance.

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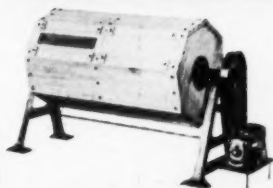
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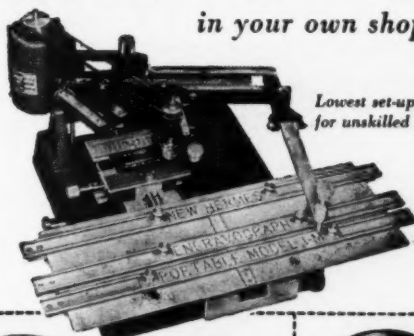
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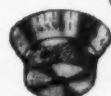
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favored the table model type, many of which are used on swiveling tables or modern wrought-iron bases. At present, Admiral is producing such molded phenolic cabinets for both 17- and 21-in. sets, in a choice of ebony or mahogany finish. Both sizes are made in duplicate sets of dies running in the same press. Production of the 21-in. cabinets, weighing 31 lb. each, consumes about 930 lb. of molding material per hour. Both these current Admiral cabinets are handsomely styled to fit in perfectly with contemporary furnishings. In addition, they offer the many functional advantages of a plastic cabinet, such as scratch resistance, integral color that never needs refinishing, alcohol resistance, and resistance to cigarette burns.

Admiral's pioneering in molded plastic TV cabinets was not limited to the production phase alone. The company has also been a leader from the start in advertising these cabinets and pointing out their advantages to prospective buyers. Following the introduction of the original Consolette model, Admiral issued a hard-hitting 18-page brochure which is probably unique in the history of

television merchandising. Designed with the same size and general format as *Life* magazine, the brochure led off with a front cover illustration showing the Consolette in an attractive room setting, tied in with the notation: "In this issue, The New Revolution in Furniture Design." Opening with brief background information on the rapid growth of the television market in 1949 and the rise of a consumer's market in TV sets, the brochure embarked upon its major theme with this headline: "One Manufacturer Earns Public Favor . . . Admiral Corp. astounds television industry by introducing . . . all-plastics TV console."

Big Savings to Consumers

Said this article, in part: "About three years ago Admiral Corp. had chalked up another exclusive! It had built the largest plastics cabinet ever molded in one piece to house a table radio-phonograph. By doing so the company eliminated many expensive hand-finishing operations common to wood cabinets. As a result, Admiral cut costs, turned out sets faster, and passed big savings to the consumer through lowered prices on

the retail product. Sales soared. The company and its dealers made money. To cope with a television market shaking itself down to normal competition in 1949, Admiral drew upon past experience. But the idea for an all-plastics TV console at first seemed ridiculous. Nothing this big had ever been molded. Plastics engineers could only theorize what might happen. To find out you'd have to try it, then keep your fingers crossed. If it worked Admiral could again cut costs, give its dealers a tremendous selling edge with the lowest priced television ever offered.

"To the very last minute all was guess-and-gamble. Nearly \$250,000 was invested in tools, dies, a two-story molding press, and over 12 months of design and developmental work. The consulting firm and actual molder of the new console, Molded Products Corp. of Chicago, shared the risk with Admiral. Both manufacturers stood a chance of out-of-pocket loss, but the rewards could be great. They went ahead . . ."

Then followed, in dramatic words and pictures, the exciting story of the Consolette—beginning with the gigantic mold and press equipment



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and continuing with a full description of preform preheating and actual molding of the 35-lb. cabinet. Other photos highlighted some of the remarkable advantages of the finished unit, such as its resistance to alcohol or cigaret burns and its ability to support the weight of seven men (1280 pounds).

Tailor-Made Materials

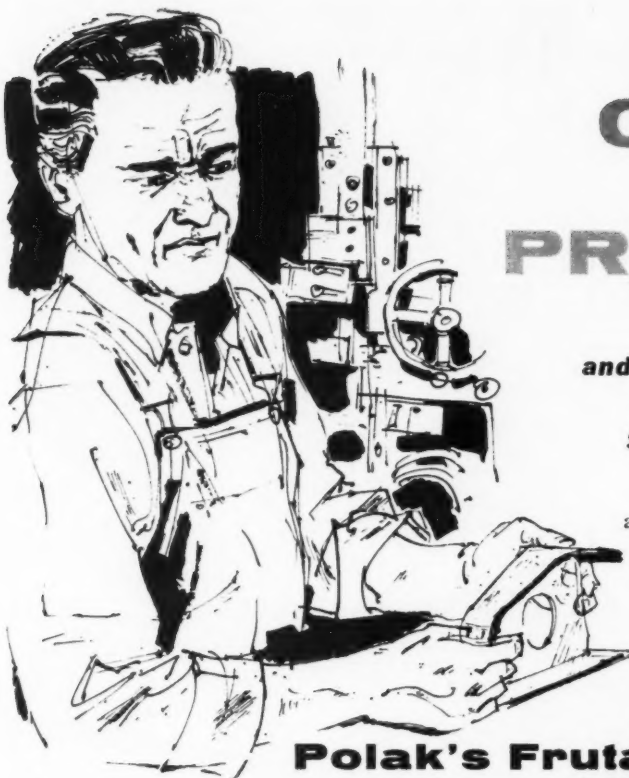
In the final page of the brochure, after pointing out that “tough, beautiful plastics take some of the thunder from wood and steel,” Admiral closed with these significant comments:

“The numerous advantages of plastics themselves read like a ‘Here's How’ to imaginative manufacturers looking for a versatile, low-cost basic material. Plastics are tough. Indeed, per unit of weight, many of today's plastics laminates are even stronger than steel. Other plastics can be sawed, planed, drilled, and glued just like wood, are impervious to alcohol and other liquids, can't burn, are excellent insulators against the passage of heat, cold, and electric current. The range of colors is limitless, far exceeding nature's rainbow in variety of shade, tone, and hue. Any manufacturer can specify ‘to order’ those particular qualities of color, strength, heat resistance, density, etc., which his particular product demands. Of all materials, plastics are truly ‘tailor-made.’

“Where plastics really shine, though, is in the mass production of one-piece molded products like the new Admiral console. Where speed, efficiency, and economy are important factors the virtues of plastics molding stand like a beacon on a rocky shore. It is not unreasonable to expect plastics to play an increasing role in the manufacture of our larger household possessions. No one anticipated an all-plastics television console until the job was done. Even bigger things are on the way.”

Not only in TV cabinets, but also in record players, radio cabinets, refrigerator parts, air conditioner cabinets, and housings for moisture conditioners, Admiral has continued to enlarge upon this prophecy. And the end is not yet in sight. That this kind of pioneering pays off is proved by the corporation's growth in net sales from \$4,693,607 in 1940 to a high of over \$250 million in 1953.—END

Modern Plastics



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A black and white photograph of a mechanical press, likely a rubber press, with a heavy base and a vertical frame supporting a horizontal pressing mechanism.



A medium priced line of presses especially designed for reinforced plastics molding is offered in the following standard sizes with a working area of 37" x 55", 47" x 41", 26" x 42", 32" x 36", and 44" x 76". Other sizes made to suit your requirements. With or without pumps and controls this line also offers the molder a complete advisory service in the production of reinforced plastics molded parts or finished products.

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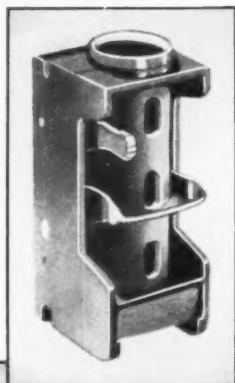
Fiber Glass Preform Machines



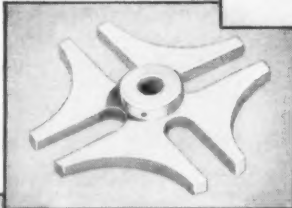
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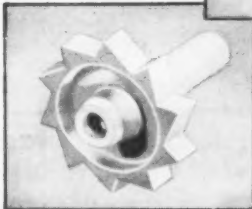
A fare collector that must function faithfully, flawlessly through years of hard service requires components of extreme accuracy. To meet every demand of durability and precision, Grant Money Meters, Inc., selected nylon components formed by Parker-built molds. Parker craftsmanship met every engineering specification; Parker molds produced score after score of identical parts to ten-thousandths tolerances — without a trace of flash — ready for assembly line use. One more example of Parker ingenuity and mold-making skill cooperating with industry to improve production — and production results!



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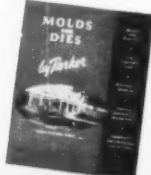


NYLON STARWHEEL — One piece molded nylon construction eliminates costly production and assembly line operations — a dramatic demonstration of Parker mold-making skill.



Investigate the flexibility of Parker's facilities — send today for FREE literature on **PRECISION MOLDS FOR PLASTICS**... by Parker!

NYLON CHANGE CARRIER — Intricate assembly molded by Danielson Mfg. Co., from Parker molds — engineered for 30 or more years of flawless performance.



Success Story

(From page 167)

expected. Melamine also had some unique advantages, one being the uniformity of each molded piece. Tolerances in ceramic ware may vary in kiln drying—a factor sometimes not altogether undesirable but a factor which also can often make the number of rejects too high.

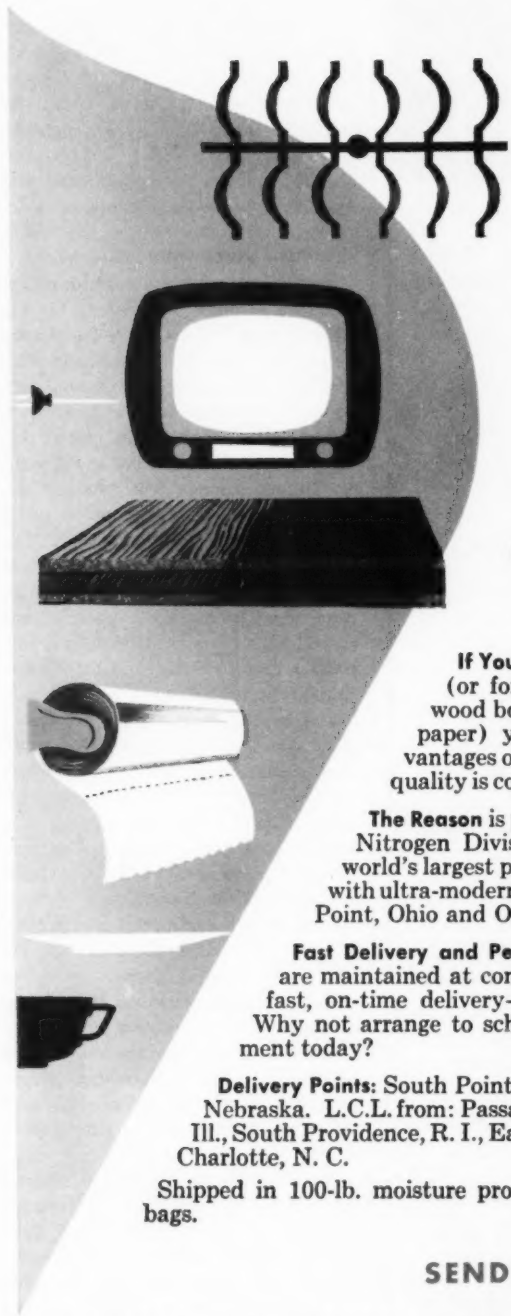
Design and Color

Probably more responsible than anything else, outside of melamine's inherent durability and break resistance, for its growing popularity and acceptance as a quality product has been the trend toward good design and new color tones. The wartime styles of trays, plates, and cups made of rag-filled melamine molding compound served their purpose well, as they still do today. But good design in melamine ware really got its start late in 1945 when American Cyanamid commissioned Russel Wright to style a new line to explore its possibilities for the restaurant, institution and, subsequently, the consumer markets.

Placed in service in several leading restaurants, cafeterias, and lunch counters, this Wright-designed ware molded of Melmac was carefully tested and observed. Gaining its first ground in the institutional and commercial markets, the new industry worked closely with dietitians and food service officials at leading universities and hospitals. Supported by advertising and direct mail campaigns by both Cyanamid and the individual molders, sales to the commercial market soon became substantial. Then began a more modest sales campaign directed to the consumer.

One of the first to launch its appeal to this market was Watertown Manufacturing Co. in 1947, with its *Lifetime Ware* styled by Jon Hedu. A simple, well-proportioned shape—the coupe plate with curled edge—established a new form for molded ware. More difficult to produce in ceramic, the coupe is contemporary in appearance and is now used by several other molders, making the coupe shape one of the most characteristic and popular shapes in melamine ware. Other lines incorporating the coupe shape or modifications thereof are International Molded

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Plastics' *Desert Flower*, Branchell's *Color-Flyte*, Applied Plastic Div.'s *Suburban*, Plastics Manufacturing Co.'s *Texas Ware* lines, and more recently, Proton's *Florence*. Northern Industrial's *Residential* employs a modified coupe design. In Canada, Maple Leaf Plastics' *Styleware* and Evermaid plates are coupe-shaped.

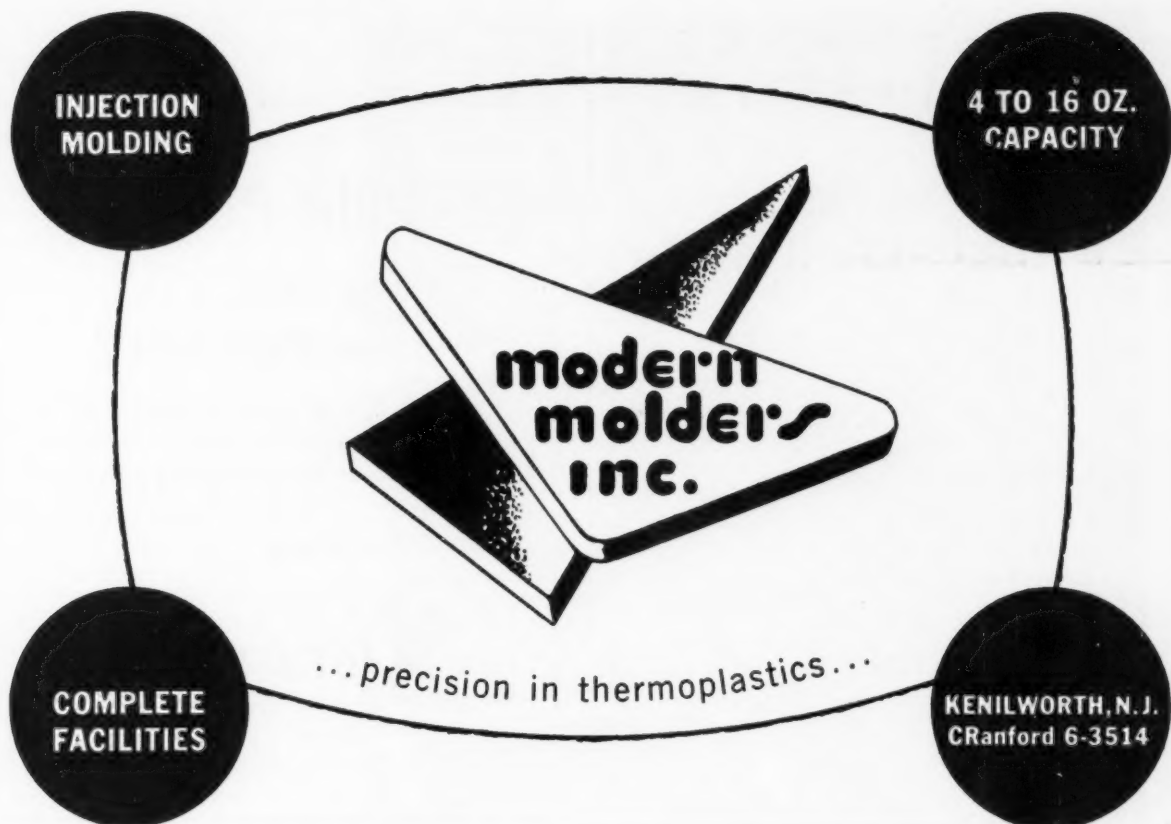
Decorated Dinnerware

But dinnerware with undecorated surfaces, though the colors be attractive and unusual, and the shapes be pleasing, still has to compete with traditional decorated china and pottery. Responding to this challenge, International included a raised design in its mold and came up with its *Desert Flower* line bearing the flower pattern as a depression in its surface. Then, early in 1952, Jon Hedus used the opposite technique in designing Watertown's *Woodbine*. Here the pattern is raised, or in bas relief, giving rise to possible comparison with the fine and traditional English *Wedgewood*.

The past two or three years have also seen molders coming up with new textured effects. *Color-Flyte* was early with a mottled effect. Last year Plastics Manufacturing Co. brought out its *San Jacinto Contemporary* in several soft two-color cloudings. Then *Residential* made its appearance, bringing not only a new, rather distinctive Russel Wright shape to molded dinnerware, but also an unusual textured effect. Two of the pale colors have a translucent quality and incorporate more than one color, while the opaque colors embody dust-size metal particles that give tiny glints to the molded surface.

With a view to further increasing the appeal of melamine dinnerware through the use of multicolor decoration, experimental work is currently well under way on a method of applying such decoration during molding. In general, the work involves the use of a specially printed paper, impregnated with melamine, which is inserted in the mold during the molding cycle.

But pattern and texture haven't been the only advances. Shape, too, has undergone some changes, and so has color. George Nelson Associates were evidently struck by the attractive appearance of oriental lacquerware when they designed *Florence*; the colors—flat black, bright orange-



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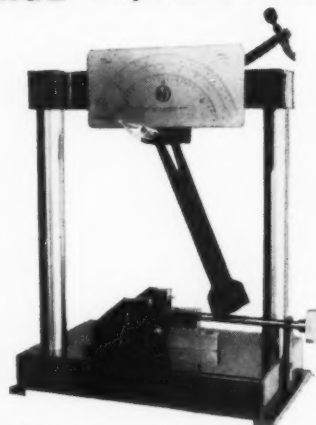


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red, beige-grey, pale mustard yellow—reflect the flavor of the Far East, as does the delicate styling.

In shaping the pieces, Nelson made sure that each could be used for two or three separate purposes. For example, the vegetable bowl, featuring rounded corners for easy removal of food, also doubles for bread, fruit, flowers, or tidbits; the sugar bowl can be used for jams or even as a cigarette container. Of particular interest was Nelson's handling of the cup and saucer. The base of the cup well is grooved to provide drainage and suction break, while the saucer incorporates a pedestal instead of a well to keep the cup from dripping if liquid is spilled.

In returning to melamine dinnerware for the first time since he styled Cyanamid's test set in 1945, Russel Wright drew more from his pottery styles than from his earlier work with plastics. His *Residential* design marks quite a departure for molded melamine dinnerware. Aside from the textured effects described earlier, Wright brought other innovations to plastic. Cups have open hook handles so that cups can fit into each other in stacking. The mold for this type of cup, of course, requires no core pin, as for the looped handle.

The dinner plate has slight protrusions at each side; the handles of the sugar bowl and cover meet in such a way that there is a space to accommodate the sugar spoon. The creamer has no protruding handles and takes minimum space in the refrigerator. Wright, also, designed with two or more uses for each piece in mind. The cover of the oval vegetable dish can also be used as a shallow food server, and the tumbler doubles as an egg cup.

Boontonware, made by Boonton Molding Co., has been one of the leading sellers through housewares departments. But Boonton, too, apparently felt the need to advance its styling and broaden its line. Designer Belle Kogan used a squared circle, or square within a circle. This new line, *Boonton Belle*, has only recently been offered to the market.

The molded dinnerware field covers more than dinnerware itself. Other food service products molded of melamine comprise a growing branch of the industry. Some of the dinnerware molders are helping to extend this market—Plastics Manu-

(To page 352)



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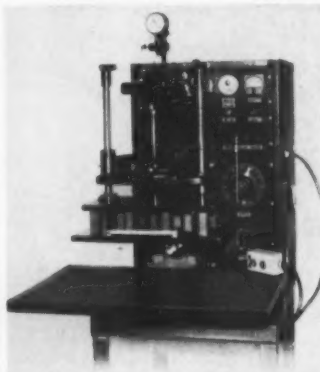


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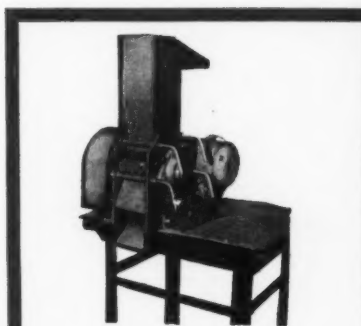
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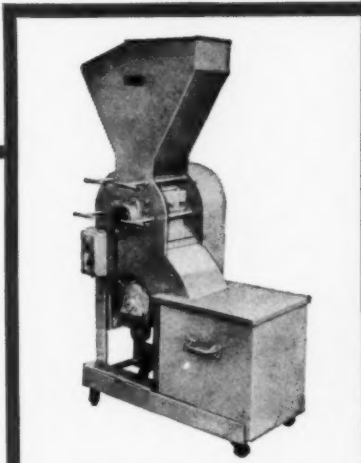
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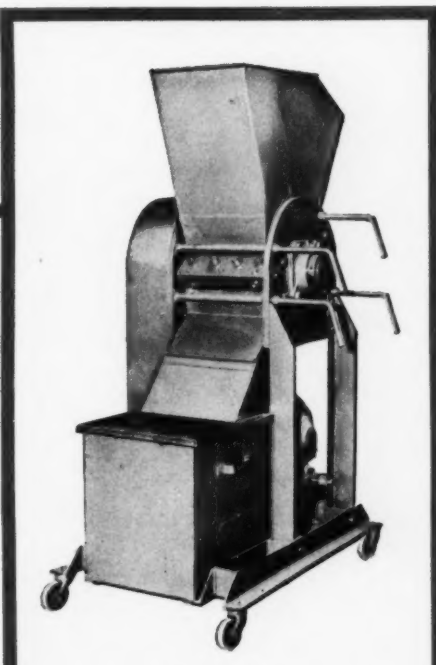
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facturing with trays and mixing bowls; Watertown with pitcher and tumbler sets and a circular buffet tray; Boonton with its buffet platter, butter dish, and butter patty; Hemco Plastics with bouillon cup and jug, tumbler, and tray set. But other applications like cutlery and kitchen tool handles, beverage servers, fountain syrup jars, and blending containers for electric mixers are being made by firms not specifically in the eating ware business as such.

Where Dinnerware Stands Today

The inherent break-resistant quality of the material itself cuts packing costs, damage, and replacement costs, and the red tape involved whenever complaints are heard and replacements become necessary. Stores report that the average unit sale for melamine dinnerware is usually higher than other dinnerware, making the profit correspondingly higher. Whenever sales resistance is met because of price, sales people can use durability as their pitch. Stores are backed up, of course, by both molders and materials suppliers with counter displays, tie tags outlining proper care, etc.

In the autumn of 1953, dinnerware molders were able to get a pretty good picture of the regard in which their wares are held by the buying public. The independent market research organization of Daniel Starch and Staff personally interviewed 2736 housewives in 41 cities and towns from coast to coast. Asking each housewife a number of searching questions, these researchers learned that, on the basis of past performance, at least one out of every five women who knows about melamine dinnerware will buy a set.

Since 36 million families didn't, as of last summer, own melamine dinnerware, the potential at that time was about 32 million place settings. For a market of this size to be created in the space of a few short years would be an achievement for any industry. Mature and with eyes on the future, the melamine dinnerware industry, can be expected to continue its emphasis on quality, good design, and intelligent and aggressive merchandising.

CREDITS: The following paragraphs list all present manufacturers of melamine dinnerware in the United States and Canada, with brand names in italics. Asterisks indicate those companies

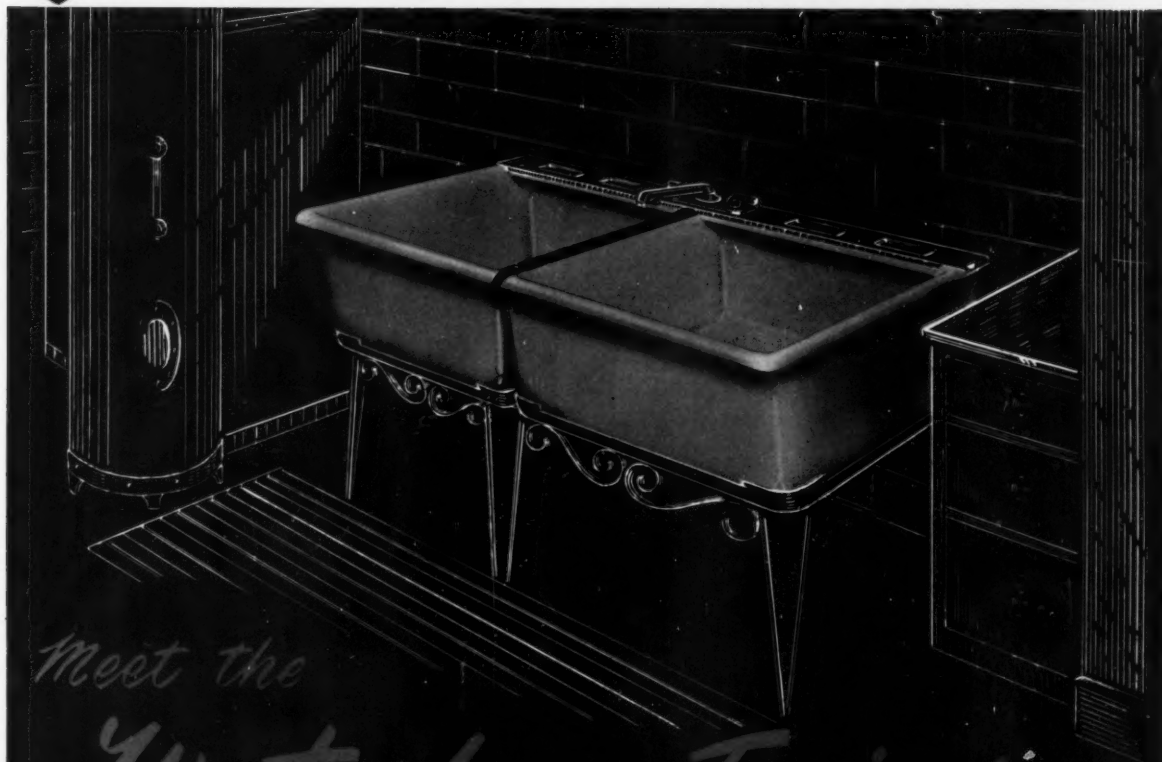
which sell both to the public through retail outlets and to commercial outlets. The others sell only to the latter.

United States: American Plastics Corp., Chicago, Ill.; Spaulding. Applied Plastics Div., Keystone Brass Works*, Erie, Pa.; Restraware and Suburban. Boonton Molding Co., Boonton, N. J.; Boontonware and Boontonware Belle. Bryant Electric Co., Hemco Plastics Div., Bridgeport, Conn.; Hemco Ware. Devine Food Inc., Chicago, Ill.; Devine Ware. Lapcor Plastics*, Manitowoc, Wis.; Meladur. International Molded Plastics, Inc., Cleveland, Ohio; Brookpark, Desert Flower, and Arrowhead. Kenro Co., Fredonia, Wis.; Holiday. Nichols Plastics & Engineering Co., Los Angeles, Calif.; Nichols. Northern Industrial Chemical Co., South Boston, Mass.; Northern Air Ware and Residential. P. R. Mallory Plastics, Inc., Chicago, Ill.; Mallo-Ware. Plastics Inc., St. Paul, Minn.; Custom Imprinting. Plastics Mfg. Co., Dallas, Texas; Dallas Ware and Texas Ware. Plastic Masters, New Buffalo, Mich.; Harmony House. Prolon Div., Prophylactic Brush Co., Florence, Mass.; Prolon Ware and Florence. The Brancell Co., St. Louis, Mo.; Color-Flyte. Watertown Mfg. Co., Watertown, Conn.; Lifetime Ware and Woodbine.

Canada: General Plastics Ltd., Toronto, Ont.; GPL. Kinghorn & Dickie Ltd., Fredericton, N. B.; Kinghorn & Dickie. Maple Leaf Plastics Ltd., Toronto, Ont.; Maplex, Styleware, Moderne, Vanguard, Evermaid, and Coloramic. Rainbow Plastics Ltd., Toronto, Ont.; Rainbowware. Rogers Bros. Ltd., Saint John, N. B.; Rogers Bros.



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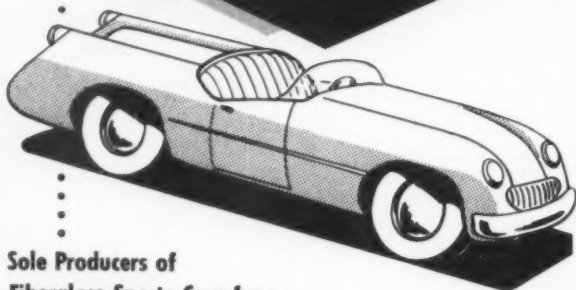
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Packaged Pools

(From page 160)

on a level stretch of lawn or backyard without excavation or extensive site preparations. With a piece of string equal to the radius of the pool swung in a circle around a fixed center, a suitable level area can be chosen and marked off. The flexible heavy gage vinyl liner is then spread out within the circle with the sidewalls on the outer edge.

A portable fence to support the pool's sidewalls is supplied with the liner. After this fence is rolled out around the edge of the liner, its ends are fastened together. For the wire mesh fence used with the Bilnor pools, the ends are tied together; for the vinyl plastisol-coated steel mesh fence used in the Doughboy pools, the two ends are locked together by passing a metal rod through end loops.

The flexible liner is then fitted over the supporting fence, the floor and side walls are smoothed down, the protective vinyl bumper around the top edge is inflated, and the pool is ready to be filled with water. Both pools have draining valves.

Lightweight, yet Durable

Despite their size, the vinyl pools are light in weight. The Doughboy pool, 18 ft. in diameter, for example, weighs only 105 lb. compactly stored in its carton.

At the same time, the vinyl sheeting is durable enough to withstand the pressure of the water without tearing. In the case of the 20-ft. diameter Bilnor pool, the vinyl liner supports the weight of more than 7000 gal. of water. All seams of the liner are electronically welded to prevent leakage. The liner also resists cracking and peeling with age and abrasion by dirt, sand, and constant use by active youngsters.

Because the vinyl resists soaps, greases, oils, and most other chemicals, it is possible to clean out the pools regularly for healthy swimming throughout the summer.

With the fence rolled up and the liner folded compactly, the pools are small enough to be put in the trunk compartment of a car or stored out of the way during the winter.

CREDITS: The pools described in this article are made from Krene vinyl supplied by Bakelite Co.

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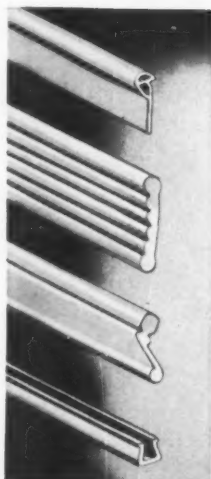


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Best Seat

(From page 169)

sealed at the top of the seat over the edge of the sheet which is sealed to the base.

Impressed by the enthusiastic acceptance of the nitrate sheet-covered seat, Church next turned to the problem of producing a plastic seat that could offer similar advantages at a lower price. The result was the introduction in 1938 of the Moltex seat, consisting of an acetate skin compression molded over a hardwood core.

In the production of the Moltex seat, the core is first machined to shape and a deep slot is cut into the back end of the seat. A metal combination plate and hinge is inserted into this slot and the complete unit is placed in a compression molding press already partially loaded with acetate molding pellets. Additional pellets are placed on top of the wooden core and the press is closed. After molding, the one-piece toilet seat, with the metal hinge now permanently molded into place, is removed and flash is trimmed off.

The one-piece solid cover for the seat is similarly manufactured. Flared brass inserts designed to interlock with the metal hinge in the seat are molded into the bottom ends of the cover to facilitate assembly.

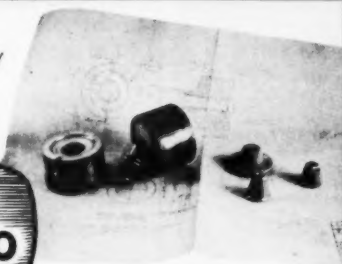
Since the hardwood core compresses in the press, the wall thickness of the acetate skin varies, averaging out to about $\frac{3}{16}$ inch. The Moltex seats are available in lustrous white or in black colors and are designed to withstand the roughest use and abuse in hotels, hospitals, and schools.

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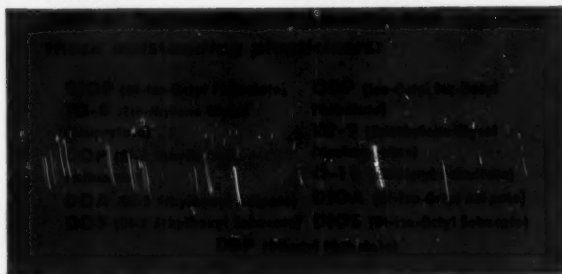
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ceive the metal hinge is molded into the core during this operation.

The molded core is then sanded and bevelled. The acetate skin is compression molded over the woodwaste core and metal hinge in the same way as it is done for the Moltex seats. The end product, however, differs in several respects. Because the woodwaste core has a uniform density, it does not compress under pressure like hardwood. As a result, the acetate skin over a woodwaste core has a more uniform wall thickness—approximately $\frac{1}{16}$ inch.

Using specially developed molding techniques, Church also produces a less expensive version of the Corex seat which features perfect uniform distribution of the 0.060 to 0.070 in. thick acetate covering.

Alkyd-Coated

A woodwaste core is also used in an alkyd resin-coated seat designed by Church for use in low-cost houses, apartments, and housing projects where a serviceable seat at a moderate price is required. The core is compression molded of woodflour-filled phenolic. After the core is finished by wet sanding to remove all mold marks and flow lines, the alkyd resin is permanently baked on. The coating, which is available in 32 different colors, has an attractive, smooth surface, exceptional wearing qualities, and is very resistant to moisture.

The only truly all-plastic seat in the Church line is the rugged all-phenolic lustrous black industrial seat designed as a low-cost model that can withstand the abuse commonly encountered in plants and factories. The phenolic seat, including a molded-in brass tube at the back of the seat which functions as a hinge bearing, is transfer molded in one piece. The single gate for the piece is located on the inside circumference of the seat near the base of the "U" shape and is removed in one simple operation by pressing the part against a rotating grinder. Approximately 4 lb. of phenolic are used in each seat.

The job being done by C. F. Church Mfg. Co. is just one more example of the extent to which plastics have firmly entrenched themselves in an industry. And the consumer is being made strongly aware of the fact.—END.

Modern Plastics

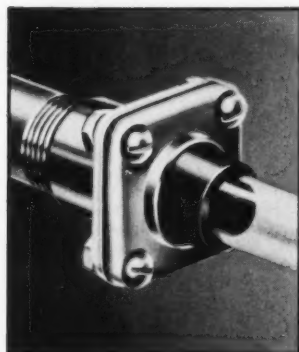


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See pages 10 - 11

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June • 1954

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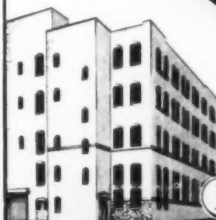
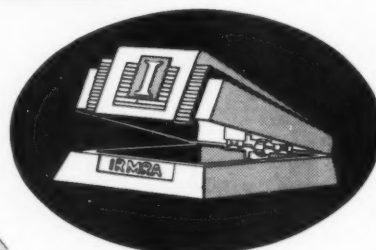
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Switch on Spouts

(From page 141)

sure to rupture the seams of the can will not produce leakage through the nozzle.

The perfection and adoption of Ronson's new plastic spout illustrates how a sound basic idea, plus detailed development work by the molder and close cooperation with the ultimate user, can enlarge the frontiers of plastics usage and give the public more attractive, useful products at modest cost. Production of the spout was preceded by more than two years of intensive work by the Mills Plastics Div., Continental Can Co., in conjunction with Turret-Seal Corp., Chicago, Ill., which supplies the closures to Ronson. Much of this activity was under the direction of H. S. Ruekberg, Mills' chief engineer. In the final stages of development, Ronson engineers also worked closely with the molder on problems associated with the molding of the caps, their high-speed automatic assembly, and application on the company's packaging lines.

Polyethylene proved to be a "natural" for this application. The material is completely unaffected by the lighter fluid. Next, its resiliency and sealing properties permit the kind of force fit necessary to prevent leakage of the fluid and to keep the spout from popping out of the housing when pressure is applied by squeezing the can. The lower section of the cap must be molded so that the rectangular opening is actually smaller than the semi-circular cavity in which the movable disk seats. Considerable force, applied by means of a pair of pliers or other tool, is necessary to withdraw one of the spouts from an assembled cap.

Production Problems

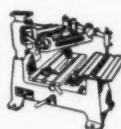
Perfection of the Switch-Spout presented interesting problems in both design and production. The body portion had to be stripped from the mold to release an undercut bead which snaps over a mating shoulder on the top of the can. Much research was necessary to determine the exact shape and depth of the bead so that the body would snap over the mouth of the can tightly enough to prevent leakage, yet not so tight as to cause collapse of the

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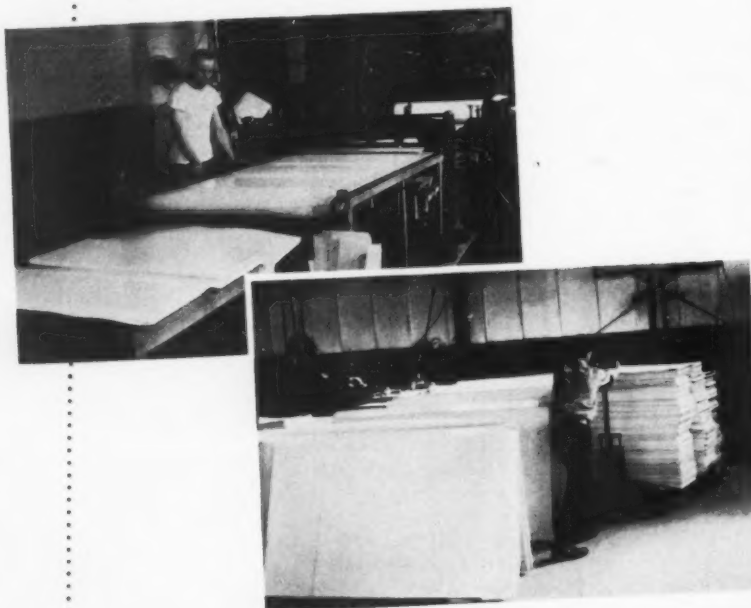
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can when the spout is forced on with production capping machinery. The molded-in socket for the turret necessitated another undercut with resultant tooling problems. This undercut must be deep enough to hold the turret securely against the valve seat, yet permit an easy rotating movement of the turret within the body.

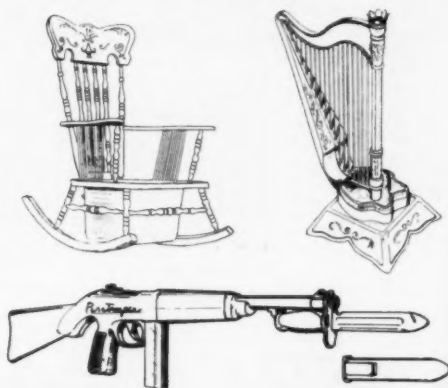
The bodies are produced in a 72-cavity mold on a 22-oz. Reed-Prentice injection machine, with a molding cycle of approximately 35 seconds. Each cavity has a very delicate 0.025-in. diameter core pin which creates the fluid delivery hole. The pin-point gates are automatically sheared as the die opens and parts drop into a box held by the operator. This eliminates any rough edges which might interfere with uniform feeding of the bodies in automatic assembly operations. Material used on this and the turret portion is dry-colored by the molder.

The turret section also presented its share of production headaches. It is produced in a 92-cavity mold on an 8-oz. Reed-Prentice injection machine; total molding cycle is approximately 30 seconds. The mold contains very long, thin, tapered core pins which produce the openings through the spouts. Normally these would be expected to present a severe maintenance and replacement problem, but the mold was so designed as to minimize this difficulty. Upon withdrawing the sprue from the die, the operator folds the sprue and draws it through a metal fixture with notches in the end, causing the turrets to strip off and fall into a container. Sprues are immediately returned to the plasticizing chamber, minimizing scrap losses.

The Switch-Spout was designed so that the only assembly operations required would include 1) snapping the turret into the body and 2) forcing the entire unit onto the can. Currently, production of the closures is running at approximately 200,000 units per day (two shift operation); involving some 1200 lb. of polyethylene. A duplicate set of tools is under construction to handle additional output in Canada.

The ingenious, specially built machine which puts the Switch-Spouts together at high speed includes two sets of traveling conveyor buckets which elevate the parts and transfer

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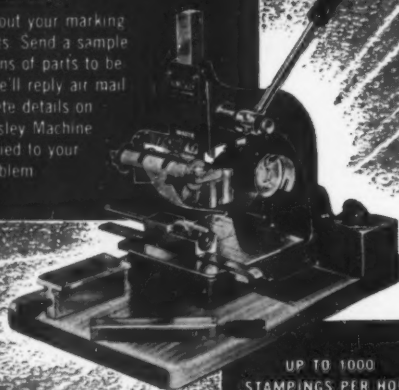


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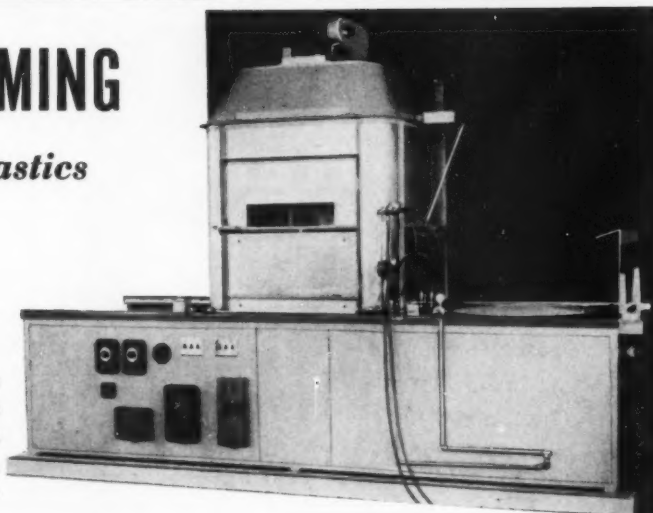
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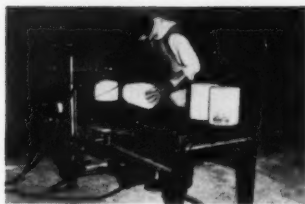
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Largest sizes available! Standard diameter ranges from $\frac{1}{2}$ " to 3" and standard lengths from 12 to 60 inches. Molded from virgin Polyethylene resin, natural or black pigmented.

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Largest sizes available! Standard dimensions range from 12" x 12" x 1" to 12" x 12" x 4" molded from virgin Polyethylene resin, natural or black pigmented. Larger sizes also available.

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them to inclined chutes in which they are correctly positioned, and a rotating sprocket arrangement which presses the turrets into the bodies after they have been aligned and brought into assembly position. Quantities of bases and turrets are dumped into supply hoppers, feeding by gravity into the conveyor buckets. As each bucket empties automatically at the top of its travel, the plastic parts slide downward into guide channels where they line up single-file in each of three grooves. Parts which fail to "get in the groove" are automatically rejected and pass through a hopper which returns them automatically to the conveyor buckets.

Sorting channels for both types of parts have vibration attachments which cause the pieces to fall into correct assembly position as they line up. As the parts converge in three lines each, the turrets are brought into position directly above the closure bodies and the forward motion of the upper and lower lines is synchronized by a short conveyor section. Turrets are dropped automatically into position on the bodies and as the notched spokes of the sprocket wheels rotate, the turrets are forced into place in the well of the base. Assembled caps emerge in a virtual stream from the machine, receiving a visual inspection before they tumble off a short conveyor into a shipping container.

Quality Control

Because of the high speed molding and assembly operations involved in this application, minute inspection of each closure is out of the question. Accordingly, the quality control system followed is based on a statistical method used on U. S. Air Force contracts. Under this system, 300 caps are selected at random from each box of 4000 units and individually checked for lack of spout, damaged spouts, faulty sealing rings, and other imperfections. If not more than two spouts are rejected for any cause out of the 300, the box is released without further inspection; but the presence of three or more faulty closures calls for individual inspection of the complete contents. In other words, the percentage of rejects cannot exceed $\frac{3}{100}$ of 1%, or one spout out of each 150 tested. In addition, random periodic checks on neck tolerances are

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made by applying closures to two fittings having maximum and minimum tolerances matching those of the can openings, and testing for air leakage with a pressure gage. Pressure applied for this test is considerably higher than that encountered under standard use conditions with the lighter fluid can.

In the Ronson plant, after the cans have been filled, the closures are fed from a hopper and applied to the cans by means of a system closely paralleling that used in assembly of the plastic parts.

Before adopting the new plastic closures, Ronson submitted cans with the polyethylene spouts to a number of extreme test conditions, including the following:

1) A parcel-post cycle exceeding the most severe hazards encountered in fourth class mailing.

2) Temperature of 130° F. for three days, to determine effect on evaporation of lighter fluid.

3) Tests at 73° F. and 0° F. for a similar period.

In all instances, test results with the plastic spouts were superior to those achieved by cans with the old-style lead spouts.—END

Big Business

(From page 123)

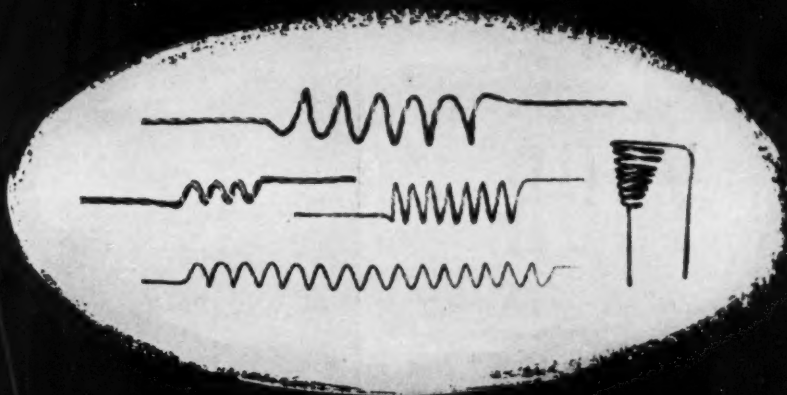
twisted-in-wire units, sealed into the handles by use of induction heat. Other plastic-handled brushes have bristles conventionally stapled.

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(To page 374)

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"CHROMALOX" FAR-INFRA-RED. Bulletin explains the advantages and flexibility of "Chromalox" far-infra-red radiant heating units as a source of heat for curing, softening, or drying plastic products. Specifications included. Edwin L. Wiegand Co. (F-402)

FIRE RESISTANT POLYESTER RESINS. Technical data sheet lists specifications and properties of "Hetron 92" polyester resin. Hooker Electrochemical Co. (F-403)

"CERAMIC" INSULATOR BAND HEATERS. Information on insulated band heaters designed to operate at temperatures of 550° F. and higher. Industrial Heater Co., Inc. (F-404)

PRIMARY PLASTICIZERS. Technical bulletin describing Di-n-octyl, n-decyl phthalate. Lists properties, specifications and comparative performances. Applications include quality film and sheeting, wire insulation, plastisols and organosols. Monsanto Chemical Co. (F-405)

TEMPERATURES FOR POST-FORMING LAMINATES. Information on how "Tempilstik" temperature indicating crayons can be used to determine whether post-formable laminates have reached proper working temperatures. Tempil Corp. (F-406)

GLASS REINFORCED POLYSTYRENE. Booklet contains information on a glass fiber reinforced molding compound for use by injection molders for the production of strong, rigid pieces with excellent dimensional stability. Koppers Company, Inc. (F-407)

PLASTICS PROCESSING MACHINERY. Catalog with data on accumulators, Banbury mixers, calenders, mills, pumps, and hydraulic presses for use in various types of plastics processing. Stewart Bolling & Co., Inc. (F-408)

PERFORATED PLASTICS. Booklet contains samples which show how plastics can be perforated for ornamentation, the passage of sound, and to permit the escape of air. Harrington and King Perforating Co. (F-409)

POLYSTYRENE RESINS. Booklet describes the general purpose, heat resistant, high molecular weight, medium impact and high impact polystyrene plastics made by this company. Data on special colorant and extrusion blends. Tables list various chemical and physical properties. Styrene Products, Ltd. (F-410)

ADHESIVE FOR POLYESTER FILM. Leaflet covers a full range of adhesives for use with "Mylar" polyester film. Applications such as "Mylar" to paper, to aluminum foil, to steel, to vinyl, and to polyethylene

are described. Flexibility, complete clarity and resistance to heat are their outstanding characteristics. Rubber and Asbestos Corp. (F-411)

"SELECTRON" POLYESTER REINFORCING RESIN. The general properties, curing characteristics, catalysts, stability, and special types of "Selectron" polyester resins are described in a manual published by The Pittsburgh Plate Glass Co. (F-412)

PIGMENTS FOR VINYL. Data bulletin describes Burgess Pigment No. 30 and Burgess Iceberg Pigment as used in the manufacture of insulated wire and cable, vinyl sheeting, synthetic rubber gaskets. Lists also their chemical, physical and electrical properties. Burgess Pigment Co. (F-413)

MOLD-MAKING. Magazine reprint outlines the basic techniques of mold-making and explains why good molds cost as much as they do. Newark Die Co. (F-414)

DIE STEEL FOR PLASTICS MOLDS. Brochure describes uses and properties of precipitation hardening pre-hardened steels which can be readily nitrided using conventional gas nitriding equipment. La-trobe Steel Co. (F-415)

MANUAL ON PHENOLIC CASTING RESINS. Complete handbook on the subject of casting resins, their uses, properties, applications, and latest handling methods. Chapters on choosing the right resin, mold selection and preparation, finishing and fabricating. Covers the making of vacuum forming molds, foundry patterns, jigs, radio cabinets, brush backs, and many other cast products. The Marbette Corp. (F-416)

STAINLESS STEEL TUBING. Illustrated booklet gives information on flexible stainless steel tubing, developed to convey a wide variety of hot liquids and gases at high temperatures. The American Brass Co. (F-417)

SPRAYED METAL MOLDS. Folder explains the advantages of metallized molds for low pressure, vacuum, and slush molding. Tells how to estimate roughly the cost of such molds. Metalmold Forming Company. (F-418)

"LESTER PRESS." Quarterly newsletter contains several articles on interesting injection molded applications. Glossary of terms used in describing special auxiliary circuits. Lester-Phoenix, Inc. (F-419)

ELECTRICAL EMBEDMENT RESIN. Data on "Scotchcast" thermosetting hot pouring and cold pouring epoxy type potting resins for electrical insulation. Minnesota Mining & Mfg. Co. (F-420)

PLASTISOL FOR FLEXIBLE MOLDS. Folder covers the characteristics and applications of "Elastomer #105," new patented plastisol-type compound, ideally suited for flexible mold making. Ber-Design Associates. (F-421)

PLASTICIZERS AND CARBON BLACKS. Latest price list of the carbon blacks and plasticizers manufactured by Godfrey L. Cabot, Inc. (F-422)

LUMINOUS RESINS. Bulletin gives information on new techniques in the luminous plastics field. Includes use of phosphorescent, fluorescent and radium activated thermoplastic resins. Luminous Resins Inc. (F-423)

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PYROMETER ACCESSORIES. Informative catalog on characteristics, specifications and uses of various pyrometer accessories including thermocouples, replacement elements and controls. Contains schematics and illustrations of latest instruments. West Instrument Corp. (F-425)

VACUUM DEEP DRAWING AND FORMING MACHINE. Bulletin on "Formvac" twin head automatic deep drawing and forming machine for converting rigid and soft thermoplastic sheets. Describes the principles of operation, specifications and typical products. Hydro-Chemie, Ltd. (F-426)

POLYESTER RESINS. Bulletin provides summary of physical properties and suggested end-use of fifteen types of polyester resins. Lists complete line of color concentrates for polyesters. Interchemical Corp. (F-427)

VINYL UPHOLSTERY. Booklet illustrates ways in which "Koroseal," a crack, stain, scuff, fade, and flame-resistant vinyl sheeting has been put to use by various manufacturers. The B. F. Goodrich Chemical Co. (F-428)

ELECTRIC HEATING UNITS. Catalog contains illustrations, application information and characteristics of many types of heating

units including band, strip, cartridge and immersion heaters, ovens, temperature controls and switches. Glenn Electric Heater Corp. (F-429)

FORMICA END GRAIN GRADE C IN MACHINE TOOL WAYS. Bulletin explains simplified procedure for installing Formica End Grain Grade C in machine tool ways, and describes the advantages of this material in such applications. The Formica Co. (F-430)

SPRAYED METAL TOOLING. Leaflet provides basic information concerning metal sprayed tools, their history, limitations, design considerations and recommended methods of fabrication. Metallizing Engineering Co., Inc. (F-431)

WEIGH-FEEDER FOR INJECTION MOLDING MACHINES. Data on the Exact Weight weigh-feeder which provides accurate weighing and visual weight indication of material fed to injection molding machines. Explains advantages of weigh-feeding or starved feeding for many types of molded pieces. Exact Weight Scale Co. (F-432)

VACUUM FORMING MACHINES. Folder gives information and specifications on a fully automatic unit for producing a wide range of products by the vacuum forming of various thermoplastic sheet materials. Vacuum Forming Corp. (F-433)

ACETONE. Technical data sheet on one of the basic chemicals of the plastics industry, used in the manufacture of methyl methacrylate and cellulosic plastics. Commercial Solvents Corp. (F-434)

USES OF POLYESTERS. Informative brochure describes the composition and utilization of polyesters. Gives chemical properties and uses of these unsaturated resins. Allied Chemical and Dye Corp. (F-435)

PRESSURE SWITCHES. Electrical rating chart, specification data, and special features of the "Meletron" line of pressure and vacuum-actuated switches for use in hydraulic systems, are contained in a booklet issued by Barksdale Valves. (F-436)

HYDRAULIC PRESS. Catalog describes 60-ton ram pressure press with 18" x 18" platen, especially adaptable to the manufacture of laminates where pressure and control are primary factors. Constructed to minimize platen deflection. Pasadena Hydraulics. (F-437)

THERMOSETTING ADHESIVE. Data sheet on a filled thermosetting resin adhesive which comes in four grades for adhering glass, metal, plastics, ceramics, wood, and other materials to themselves or each other. Armstrong Products Co. (F-438)

CUTTING MILLS. Description of cutting mills for reducing thermoplastic materials to granules suitable for extrusion and injection molding. Lists four machines with capacities from 35 to 400 pounds per hour. Condux-Werk. (F-439)

PLASTICIZER COMPONENTS. Data sheets contain specifications of several methyl esters and fatty acids of use in the manufacture of plasticizers for vinyls and other plastics. El Dorado Oil Works. (F-440)

PLASTICS COLORING. Handy folder lists numerous shades of dry colors for use in coloring plastics. Contains also sundry products of interest to the plastics molder. Smith Chemical & Color Co. (F-441)

PROCESS TIMERS AND TIME SWITCHES. Catalog on the complete line of General Electric time switches, process timers and time meters contains selection and application information plus descriptions of the various types and models available. General Electric Co. (F-442)

AUTOMATIC CUTTER. Full details on the "Automatic Production Cutter" which cuts paper, plastics, cloth, and other soft materials into uniform sheet sizes using an electronic measuring device for predetermined lengths. Hobbs Mfg. Co. (F-443)

COATING AND DECORATING. Technical data sheet describes "Vinaplas-Lac," a decorative coating for flexible vinyls, plastisols, and plastigels which may be dip-coated, sprayed or brushed on to yield a tough acid, alkali, and chemical-resistant film. Schwartz Chemical Co., Inc. (F-444)

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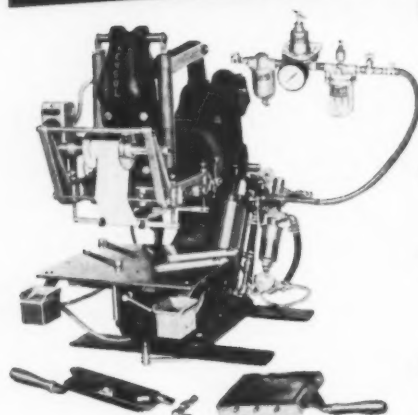
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acrylics, the appeal is on appearance, with emphasis on beauty.

Through dealer education the company had made its customers quite sophisticated concerning plastics and has contributed to consumer satisfaction. The educational advantage of the "Stanley Hostess Party"



Twisted wire is heated by induction coil (top), then forced into acetate handle for permanent fix (bottom)

method of merchandising as compared with house-to-house or other retail operation is considerable, because in the quiet and convivial home party atmosphere time may be taken to explain to the customer the purposes of plastics applications in brushes.

CREDITS: Custom molders and fabricators serving the company in its brush business are Worcester Moulded Plastics Co., Worcester, Mass.; Prolon Plastics Div., Prophylactic Brush Co., Florence, Mass.; Autograf Brush & Plastics Co., Inc., Watervliet, N. Y.; F. J. Kirk Molding Co., Inc., Clinton, Mass.; F. R. Schreiter, Inc., Clinton, Mass.; Marlette Corp., Long Island City 1, N. Y.

Rugged Rainwear

(From page 133)

trends require re-styling the rainwear to keep it up to date. Greater attention is paid to such details as collars, hoods, drape, garment lengths, and other details that are important to an increasingly fashion conscious public.

The new emphasis on fashion in women's rainwear is indicated by a recent addition to the Exylin line which features an attractive check, or hound's-tooth design, enhanced by embossing which gives the vinyl film a rich fabric appearance. The fresh styling of this coat includes a standup collar, large raglan sleeves with deep armholes, simulated cuffs, new underarm vent for good ventilation, box style back with belt, roomy pockets, and a button-on style hood which ties beneath the chin and buttons to the coat at the shoulder. Transparent molded plastic buttons add another chic touch. As in the case of other items in the Exylin rainwear line, this coat is supplied with a smartly styled, convenient carrying case of matching material.

Despite improvements in the merchandise and the impact of inflation, today's Exylin rainwear items sell at a cost equivalent to or below that of comparable 1940 models. However, available price ranges have been expanded both upward and downward to give the consumer a greater variety of choice. Within the current retail price range of \$3.95 to \$8.95, today's purchaser can make her choice from hooded raincoats selling at \$3.95 and \$5.95, an excellent raincape at \$5, or the highly styled raincoat described above at \$8.95.

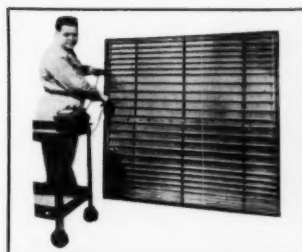
Charles McCoy and Hugh Jones point out that one of the basic operating principles of their organization calls for minimum inventories in the hands of dealers, promoting healthy turnover, profitable operation for the dealer, and frequent replacement of stocks with fresh merchandise. No attempt has been made to compete with the rainbow on available colors; colors have been largely standardized on smoke gray, white translucent, pastel green, and pastel blue. Sizes have also been developed so that one of the three standard sizes—small, medium and large—will fit most customers attractively. In some types of garments, such as the \$5.95



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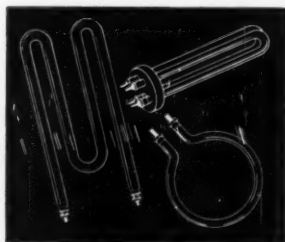
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Each installation of GLENN STAR INFRA-RED HEATING PANELS is constructed to meet customer's needs, thereby insuring high intensity radiation where it is most needed.

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raincoat with Peter Pan collar, regular dress sizes are used.

All Exylin rainwear items are boxed in attractive green and black packages which insure the customer that he or she is getting fresh, quality merchandise, just as it left the factory. The same basic color scheme gives continuity to McCoy, Jones mailing pieces, ads in trade publications, counter display cards, and other printed material used in connection with the Exylin rainwear and such associated products as closet accessories, garment bags and covers, and other household items.

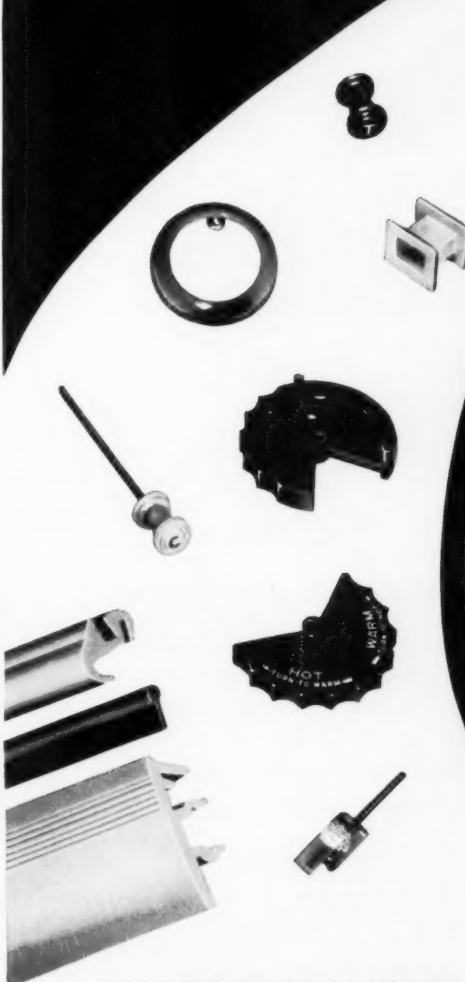
Informative Labeling

Packed with each item in the Exylin line is an illustrated informative label telling what Exylin film is, describing some of the principal products in the line, and giving directions on how to take care of the material for best service. Under the heading "What you can expect of Exylin," customers are told that the material resists wear, is waterproof, will not mildew or stick together, and is smooth and dry to the touch. Further, they are informed that grease and oil will not damage the vinyl film, that it resists most acids, is non-toxic, drapes beautifully, and returns to shape if stretched. By placing this information directly within each package, the manufacturer makes certain that the ultimate user will derive maximum service and satisfaction from the product.

In 1951, McCoy, Jones & Co, in cooperation with the Bakelite Co., sponsored a color sound film which began with the manufacture of Exylin material and continued through the various operations involved in fabricating Exylin rainwear. Designed to provide helpful information for retail ad managers, merchandise managers, and sales personnel, this excellent training film was shown in scores of leading retail stores throughout the nation, doing much to build interest in sound merchandising methods.

In an industry which too often in the past has been hurt by the appearance of sub-standard merchandise and cut-throat selling practices, creating only ill will on the part of the buying public, these sound quality control and merchandising policies prove once again that there is no substitute for quality in building a lasting business.—END

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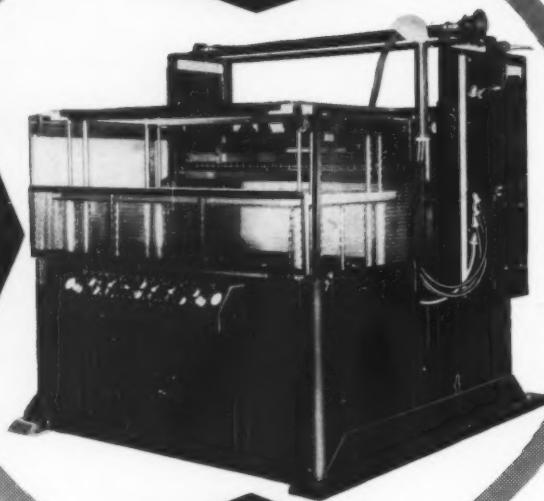
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Table Cover

(From page 157)

a welcome accessory in almost any home. There has been a slight tendency to cheat a bit in some cases and substitute a 5.2-mil film for one that is supposed to be 6, but by and large the industry is prepared to smother any outbreak of cheap covers by the simple procedure of marketing the better product in large quantities at a reasonable price.

Comparatively new and different is a flannel-backed tablecloth. Fabric-backed vinyl table covers have been on the market a long time. Most of them are spread-coated. But this one is vinyl film laminated to flannel. It has many advantages over the spread-coated type. In the first place, a producer can select any of hundreds of printed and textured film designs and thus gain a wide flexibility in choice of patterns. The laminated type has a more flexible and softer feel or hand, it is nicely cushioned, won't slip, and there is no danger of plasticizer migration.

This particular tablecloth is printed on the upper or exposed surface, but it is planned to lock-in the color or decoration in a later model. That is, the film would be reverse printed and laminated with the decorated side next to the fabric backing. In this way, high abrasion resistance will be obtained and colors can't wear off. Furthermore, the product serves as both tablecloth and table cover.

This new laminated tablecloth sells for \$3.49. It is good proof that vinyl products can be upgraded and sold in a market with quality goods.

Pricewise and costwise, the film-to-fabric or film-to-film laminating process is in the middle range between very thin and very thick calendered or solution-coated materials. It could well meet the standards of the younger generation in particular—those whose income is modest but who rebel at using goods that are obviously low-grade and poorly styled. Producers are hopeful that the laminating process will prove a good horse to ride in their progress toward providing the customer with a high-quality product.

CREDITS: Krene film in table covers by Bakelite, Co. converted by Toscani Fabrics, Inc. Covers shown are fabricated by Mahana Textiles, Inc., Adjmi Mfg. Co., and Weiss & Klau, Inc.

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3/16"	5/8"
3/4"	3/4"
5/16"	7/8"
3/8"	1"
7/16"	1 1/8"
1/2"	1 1/4"

TUBES

1/16" wall	1/8" wall
3/4" O.D.	3/4" O.D.
5/16" "	5/8" "
3/8" "	3/4" "
1/2" "	7/8" "
5/8" "	1" "
3/4" "	1 1/4" "
7/8" "	1 1/2" "
1" "	1 3/4" "
1 1/4" "	2" "

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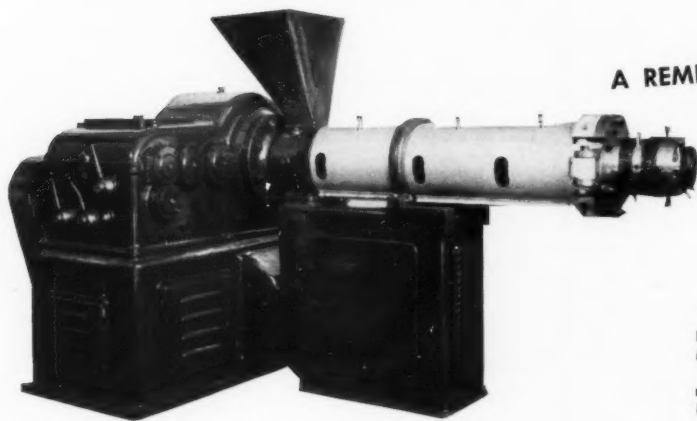
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Plastics Films

(From page 226)

ing film thickness, but these results are not presented graphically as the temperature cannot be determined as accurately as the other properties. The wide range of values for a given material may be attributed to differences in formulations.

It should be stressed that the curves for the various film material types, such as those in Figs. 4, 6, and 8, are not design curves. The points on these curves are not averages of the same number of values and the curves are, therefore, only general expressions of the results.

One type of plastic film cannot be categorically described as superior or inferior to another on the basis of property values alone. A specific property value for one material may be higher or lower numerically than that of another, but the superiority or inferiority can be assessed only on the basis of a particular application. For example, one application may require a film with a high tensile elongation, whereas for another a film with a low tensile elongation

would be more satisfactory. To select films for particular applications, the properties and chemical types should be studied in relation to the service conditions involved in the application and to the design of the item. Once a material is selected on the basis of such a study, simulated service tests on prototypes are

recommended to give additional assurance. Then the property values can be used to prepare procurement specifications for the specific film.

References

1. 1952 Book of ASTM Standards including Tentatives, Part 6, Rubber, Plastics, Electrical Insulating Materials. American Society for Testing Materials, 1916 Race Street, Philadelphia 3, Pa.

2. Federal Specification L-P-406b, "Plastics, Organic: General Specifications and Test Methods." For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. Price 50 cents.

3. Federal Specification UU-P-31b, "Paper; General Specifications and Methods of Testing." For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. Price 25 cents.

4. Commercial Standard CS192-53, "General Purpose Vinyl Plastic Film." For sale by the Superintendent of Documents, Government Printing Office, Washington 25, D. C. Price 10 cents.—END

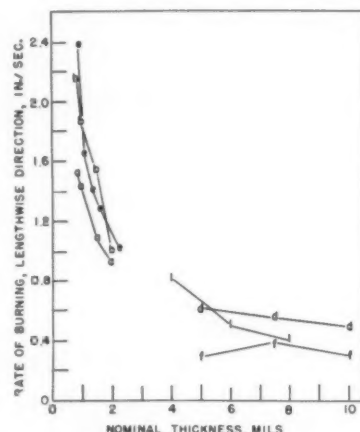
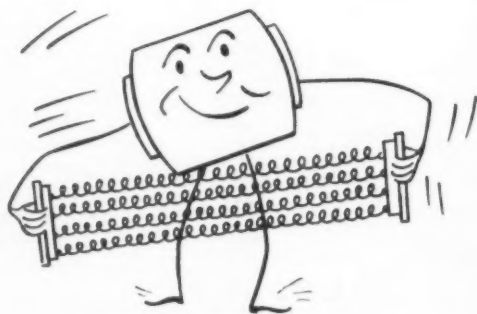


Fig. 12—Rate of burning for groups of similar samples of plastics films. See Table II, p. 203, for sample designations

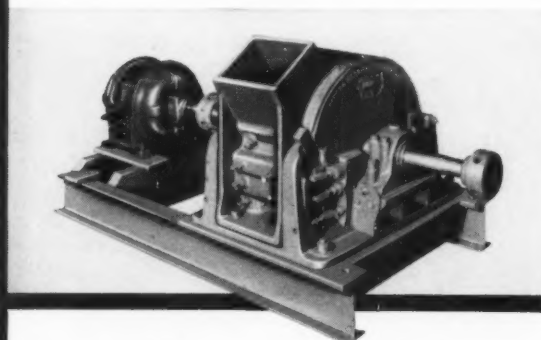


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See pages 10 - 11

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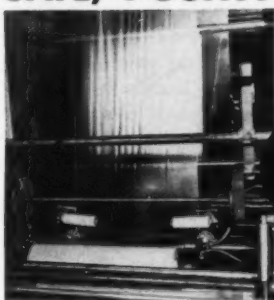


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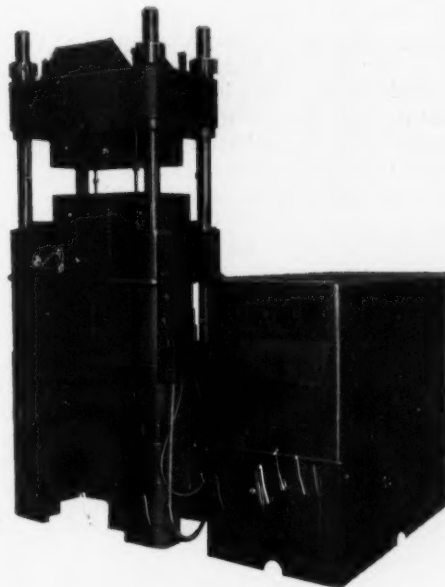
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THE PLASTISCOPE*

NEWS AND INTERPRETATIONS OF THE NEWS

By R. L. Van Boskirk

Plastics at Packaging Show

DOMINATED by plastics as usual, the Packaging Show at Atlantic City, N. J., proved once more that the combination of utility and glamor furnished by plastics has been a principal factor in the promotion of packaging as a leading American industry.

Of all the plastics in applications on exhibit, polyethylene was probably the most prominent. Its comparatively free supply now in contrast to its scarcity in other years no doubt contributed to the scores of packaging ideas in which polyethylene has become the central theme.

New Uses—Comparatively new uses for polyethylene film in abundant variety showed how the film could be used for many purposes other than packaging. Some of the suggested uses for polyethylene film in addition to those which have already had wide publicity were: box liner for apples; root crops—even parsnips may possibly become popular through attractive display in a polyethylene bag; a liberal supply of empty polyethylene bags in a crate of lettuce—the grocer packs individual heads in them for display after the lettuce reaches his store; painter's drop cloth; covers to drop over plant machinery at night to keep it free from dust and dirt; insulation sheets under cement; replacement for tar paper under shingles on a roof; bags for soft goods; celery packing; poultry bags; covers for seed beds during fumigation; covers used for winter protection of rose bushes; and many others in addition to the already established uses for food packaging.

There were also polyethylene coatings such as on cellophane which is used for packaging chopped ham, pickles, sausages, and popcorn kits. Coated or laminated to paper, it was shown as useful for such things as packaging Pabulum and cereals, and

in multi-wall bags. Grease-resistant waxed paper containing low molecular weight polyethylene indicates that this use is growing rapidly, but the polyethylene involved is only 2 or 3% of the compound. The multi-wall bag use has not grown as rapidly as expected, probably due to cost in comparison to asphalt, although it is possible that declining costs in polyethylene may change that situation somewhat. Coated board for milk bottles may possibly be the next big use to skyrocket for polyethylene-coated paper products. The future in the coating field, including the laminate or coating on foil, seems to have faltered a bit at present, but producers feel that the comparatively small growth is only because prospective users are still testing or not yet familiar with what can be done.

Collapsible Tubes—Another promising polyethylene packaging use is in collapsible tubes for holding various kinds of food and cosmetic products, including the one-shot tiny tubes intended to hold just enough content for one-time use only.

One exhibitor made a point of showing how polyethylene packaging improved sales and cut costs. Thus, a tobacco firm used a coated foil for pipe tobacco, reducing packing cost 30%, and got five times more product protection and shelf life. He thinks it may slow up the 50% decline in pipe tobacco sales during the last decade.

Polyethylene wrapped textile goods make it possible for the customer to handle goods and enable the retailer to reduce markdowns. A package for straw sippers reduced cost of the former package by 75% and raised sales 700 percent.

4000% Increase—A cake decorator packaged in polyethylene increased the producer's sales by 4000 percent. As his star performer among the examples, this exhibitor claimed that squeeze bottles were the motivating factor in making deodorants a real

big factor in the cosmetics industry and that double-wall polyethylene cosmetic jars will minimize permeability and take the cosmetic industry by storm.

But polyethylene didn't take all the plastics laurels by any means. Cellulose acetate film and sheeting were present at the show in abundance to demonstrate why its volume has grown so markedly in the last two years. Prominent in the acetate displays were vacuum-formed shapes and signs for point-of-sale displays for novelties, toys, and all manner of products. Significant was a line of Sears, Roebuck products displayed under vacuum-formed sheets—things like shoes and door hardware with the screws attached inside the transparent cover so they wouldn't come loose or be lost.

Metalized acetate was highly prominent among the displays. Printed acetate laminated to foil to prevent pin holes and give strength to the foil or to Pliofilm for moisture-proofness and heat-sealing properties were some of the acetate combinations on exhibit. Even a package for dead mice was on hand. Built so the mouse couldn't escape after entering and tempted to his death by a poisonous tidbit within the trap, the mouse gets a 7½ gage thick acetate casket that the housewife can easily cast aside without touching the mouse. Sale of more than ½ million of these deadly little traps has been reported.

Progress in Vinyl—Vinyl has had tough going in working into the packaging field, but there are many believers who think it has arrived and will move forward continuously. Exhibits at the show tend to prove their belief. Products produced from plastisols on display were a windshield water reservoir; collapsible tubes; disposable containers; vinyl sponge used for packaging instruments; rigid vinyl sheet vacuum formed into cigar boxes; feed, seed, salt, and fertilizer bags made from plastisol-coated fabric; cast film laminated to foil to permit heat sealing for articles that require impermeability; a film for processed meat packaging, and some very fine vinyl bags for display of high-grade soft goods.

Polystyrene was evident largely as a material for boxes. Candy, ice cream, bow ties, egg nog, and fruit cake are some of the products now

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VISIBILITY *by Swedlow*

IN THE NAVY HOK-1 HELICOPTER



The Navy's newest helicopter, the HOK-1, manufactured by The Kaman Aircraft Corporation, is a four-place, high performance aircraft used as a general utility helicopter and aerial ambulance. New types of aircraft present difficult engineering and optical problems in enclosures, which Swedlow's specialization in transparent glazing applications is called upon to solve. The transparent enclosure of the HOK-1 is an outstanding example of Swedlow's precision engineering and production.



LOS ANGELES, CALIFORNIA • YOUNGSTOWN, OHIO

THE PLASTISCOPE

going to market in lustrous styrene.

Another plastic not so evident to the eye but lurking in compounds of highly important exhibitors at the show was polyvinyl acetate, now widely used by nearly all the adhesive suppliers. The high-speed operations now so common in gluing are generally based on polyvinyl acetate in glue formulations.

Butyrate Sheet Moves Into Outdoor Sign Field

BUTYRATE sheet developed especially for use in outdoor signs after a long experimental period has been announced by Eastman Chemical Products Co., Inc., Kingsport, Tenn. The company's butyrate film and sheet have been used for indoor signs for several years. A notable example is found in the vacuum molded 5- by 3-ft. signs of 0.060 in. thickness used over the frozen food sections in grocery stores and markets; but up until now, the material has not been suitable for outdoor signs. The new Tenite butyrate formulation retains the same ease of vacuum forming and exceptional strength in thin sections as the formulation used for indoor signs. The new material can be extruded in satisfactory sheets up to 0.125 inches.

Sample sheeting extruded from the new formula has been tested under continuous exposure to sun and weather over a three-year period. Results indicate that signs made from the sheeting will withstand five years' exposure with practically no surface deterioration.

Vacuum-formed butyrate signs for indoors or outdoors can be fastened tightly to metal frames — the Tenite material has a natural resiliency which absorbs thermal movements. In other words, the contraction and expansion of metal frames will not affect the butyrate or cause it to break loose from the fastenings.

The material is lower in cost than most other transparent plastics used for signs. Also, signs can be light in weight because the material can be used in thin sections, according to one fabricator who has had considerable experience with it during the development period. Furthermore,

it has excellent compatibility with inks and lacquers so that the back of the sheet can be painted or sprayed to give the impression of high gloss and depth of color.

Foamed-In-Place Isocyanates

LICENSED under Du Pont patents, a newly formed company, Isocyanate Products, Inc., P. O. Box 1681, Wilmington, Del., is now producing foamed-in-place expansible resins based on reaction products of polyisocyanates and marketing them as two-part liquid formulations under the trade-name of Ipi-Isofoam.

The new material is self-cured to produce a low density product suitable for many applications. A number of two-component formulations are available to produce foams ranging in density from a resilient foam of 2-lb./cu. ft. density to a rigid foam of 20-lb./cu. ft. density.

Ipi-Isofoam is easily prepared by mixing together Ipi-Isofoam compound and a catalyst at ordinary room temperatures. The slightly viscous mixture can be poured or sprayed into cavities of almost any size or shape. The chemical reaction brought about by mixing the two components produces carbon dioxide gas which expands the resin to fill the container. The heat generated by the chemical reaction cures the expanded foam into a solid mass that adheres firmly to the sides of the container.

Because of its poor heat conductance properties, plus its resistance to moisture and mold, Ipi-Isofoam can be used for insulating home freezers, refrigerators, water coolers, refrigerated trucks and railroad cars, and other refrigerated units. Good insulating values and the ease with which it can be applied make it suitable for covering low-temperature lines, low-pressure steam lines, and valve clusters located in relatively inaccessible places. The foamed resin can also be used to great advantage in sandwich construction for prefabricated building panels and in reinforcing various structural members and units in the aircraft and automotive fields.

As a core material for radomes in aircraft and guided missiles and in

the potting of radio and other electronic circuits, the strength and electrical properties of Ipi-Isofoam can be effectively utilized.

The material is also suitable for most types of buoyancy and flotation gear. For articles subject to constant immersion in water, an additional thin coat of paint or cover of plastic over the foamed resin provides extra protection.

Mica-Filled Phenolic

ANNOUNCEMENT of a new mica-filled phenolic molding material with improved moldability and mechanical strength has been made by Monsanto Chemical Co.'s Plastics Div., Springfield, Mass.

Moldability improvements made in the resin, called Resinox 3001, are claimed to result in better mold release and to give better flow, faster cure, and fewer surface defects in the finished product. At the same time, impact, flexural, and tensile strength have been increased 20% to give greater resistance to cracking around inserts and other areas of high localized stress in the molded piece.

Resinox 3001 may be molded under the same conditions as are employed with various other mica-filled phenolics. Its electrical properties also are essentially the same. The material is recommended for use in radio tube sockets, radio tube bases, electrical connectors, terminal strips, and miscellaneous electrical components where both good electrical and mechanical strength are required.

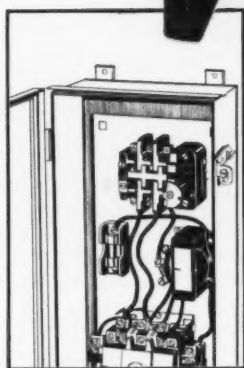
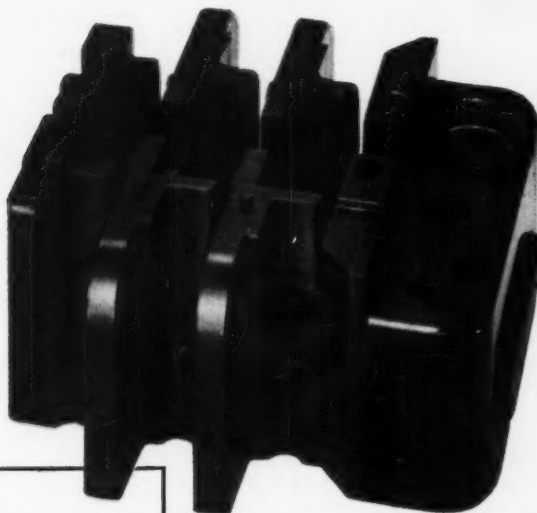
Current price of Resinox 3001 in carload of truckload drums is 35¢ a pound.

Bakelite Fluorothene

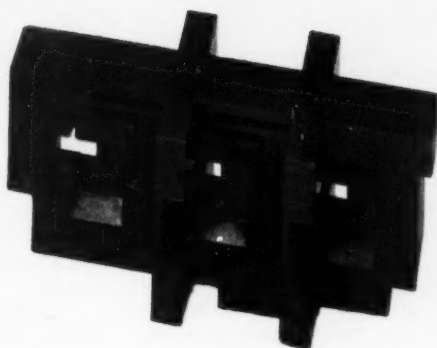
COMMERCIAL production of Bakelite fluorothene resins has been announced by Bakelite Co., a Div. of Union Carbide and Carbon Corp., 260 Madison Ave., New York 16, N. Y. The new continuous-process plant, located at South Charleston, W. Va., assures a greater uniformity of material than is possible with the old batch-to-batch method of production.

The fluorothene plant is being operated by Carbide and Carbon Chemicals Co. (of Union Carbide and Carbon Corp.), but Bakelite will handle the sale of the material. There are only two other companies

How would you handle this electrical parts problem?



Combination starter, containing parts molded of Monsanto's Resinox 3700 thermosetting material, manufactured by Arrow-Hart & Hegeman Electrical Co.



Arrow-Hart
solved it with
new
RESINOX 3700

Arrow-Hart & Hegeman Electrical Company of Hartford, Conn. needed a strong, stable, electrical-grade material with high arc-resistance for important parts of their combination starter shown here. They specified Monsanto's new thermosetting molding powder, Resinox 3700. Result: Complete satisfaction!

Resinox 3700 is the ideal all-around material for magneto ignition, motor control and electronic circuits, and other electrical applications.

- 1** It combines high arc-resistance with outstanding dimensional stability. Eliminates undesirable after-shrinkage.
- 2** It has excellent moldability and relatively good impact resistance, plus good transfer molding properties.
- 3** It offers superior heat resistance.

Perhaps Resinox 3700 is exactly what *you* need to solve an electrical equipment problem. Write today for full information!

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MONSANTO CHEMICAL COMPANY, Plastics Division, Room 2606, Springfield 2, Mass. Please send me complete information on Monsanto's new Resinox 3700 arc-resistant material.

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Company _____

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in commercial production of fluorocarbon resin production. Du Pont produces Teflon which does not contain the chlorine element, and although it can be molded by a sintering process, it is not moldable by the injection process. M. W. Kellogg Co. produces Kel-F which does contain chlorine and can be injection molded.

Bakelite's fluorothene resists heat up to 390° F. and withstands even the most corrosive chemicals, such as fuming nitric acid. The current price of these resins ranges from \$11 to \$12 per lb. in ton lots. A large part of the initial production is being absorbed by the military. The rest is being used in the electrical and chemical industries.

High softening temperature, resistance to burning, chemical inertness, weathering and moisture resistance, good electrical and low-temperature properties, and high tensile and compressive strengths make Bakelite fluorothene resins of interest for a large variety of applications. They work satisfactorily over a wide temperature range from -320 to 390° F.

Composed of fluorine, chlorine, and carbon atoms tightly bound together in long chains, Bakelite fluorothene is technically known as a polymer of chlorotrifluoroethylene. Three high molecular weight resins designated as Bakelite fluorothene FYTD, FYTH, and FYTS are available in pelletized and granulated form. These resins are graded according to their melt viscosity at 446° F., which is in the order of 5, 15, and 50 megapoises, respectively.

Vinyl Ethers

PRODUCTION on a development scale of vinyl ethyl ether polymers has been announced by H. F. Robertson, manager, New Product Engineering Dept., Bakelite Co., a Div. of Union Carbide and Carbon Corp. Production equipment is being installed to produce these polymers in commercial quantities.

Pressure-sensitive adhesives based on vinyl ethyl ether polymers are characterized by their stability, lack of color, uniformity, and other de-

sirable properties. Feeding tests conducted on laboratory animals indicate that toxicity should not present a problem because of its low order of magnitude.

These polymers are being offered in two molecular weights. One polymer has a relatively low molecular weight and is an extremely viscous liquid at room temperature. The other polymer has a medium high molecular weight and is a rubber-like solid with a slight tack. These two polymers are compatible in all proportions, allowing the formulator wide latitude in controlling adhesive and cohesive strength.

Tupperware Anniversary

"WE CANNOT afford to forget that most people will tend to regard plastics products as all good or all bad, depending upon their experience with them. The fundamental truth that we must get over to the buying public lies somewhere between the extremes for plastics, just as it does for metals . . . Every customer for his own protection must learn sooner or later which plastics are best suited to make which end product. He must learn the service limitations of the plastic in the products he buys and, eventually, he must be able to ask for the product he wants in terms of the type of plastic of which it is best made."

The foregoing sage advice was given to 600 dealers, distributors, and managers of Tupperware Home Parties, Inc. by H. K. Intemann, vice president and general sales manager of Bakelite Co.

The occasion was the dedication of Tupperware's new headquarters building at Orlando, Fla. The new 60,000-sq. ft. structure is located on a 1000-acre tract along the Orange Blossom Trail. Included in the building is a museum tracing the evolution of dishes and a model home that includes a magic kitchen complete with all the latest equipment for modern living. Dedication of the museum was marked by the unveiling of a painting of Mrs. Brownie Wise, vice president and general manager of Tupperware. In

three years she has led the company to second place among companies specializing in home party plan selling. The multi-million dollar corporation has doubled its business during each of the past two years and even more rapid growth is expected this year.

Over \$35,000 worth of prizes were given to Tupperware salesmen and women at the ceremony.

Isocyanate in 195?

JOINTLY owned by Monsanto Chemical Co., St. Louis 4, Mo., and Farbenfabriken Bayer A. G., Leverkusen, Germany, a new company is being set up in this country for the production of isocyanate chemicals. Vice president J. Russell Wilson, general manager of Monsanto's Research and Engineering Div., says that no decision has been made as to the location of the isocyanate plant, or when it will come in.

Isocyanates are used to produce either rigid or flexible porous plastics, new synthetic rubber formulations, fibers, adhesives, and as intermediates in making other chemical compounds. The flexible and rigid porous plastics are expected to be among the major applications for isocyanates.

Indeed there are many prognosticators who believe that Monsanto is being coy and extremely conservative in anticipating the future for isocyanates.

High-Pressure Containers

FIBROUS glass-reinforced plastics high-pressure cylinders will be made on a new experimental contract for Wright Air Development Center, United States Air Force, by Taylor-Wharton Iron & Steel Co., Cincinnati, Ohio. This is the second development contract for high-pressure cylinders. For the completed contract, cylinders with 4 in. outside diameter by 20 in. long were fabricated by winding eight strands of fibrous glass yarn simultaneously on a suitably shaped core. A metal insert at the valve end opening permits metal-to-metal contact for threads.

The weight of the completed cylinder, less valve, is 5¼ lb., or almost 30% less than the same size steel cylinder. Gunfire tests with both .50 caliber and 20-mm. projectile were passed successfully with no shattering of vessel. H. E. Cragin, Jr., di-

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Liquid

BARIUM-CADMIUM STABILIZER

ADVANCE STABILIZER BC-105

**PLASTISOLS,
ORGANOSOLS,
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RIGID COMPOUNDS**

Plastisols & Organosols: Liquid for easy use. Exceptional light and heat stability. No viscosity build-up. Eliminates air-bubbles.

Calendered & Rigid Compounds: Exceptional heat and light stabilization.

TRY THESE OTHER ADVANCE STABILIZERS

STABILIZER C-77

Liquid cadmium complex stabilizer for outstanding heat and light stabilization. Overcomes plating difficulties, printing and adhesion troubles common with metallic lauric type stabilizers. Stabilizes sensitive organic pigments. Prevents spewing and oxidation of most secondary plasticizers.

STABILIZER E-49

An effective epoxy-type stabilizer. Usually used in combination with one of our metallic stabilizers to give maximum heat and light stability. Stabilizer E-49 also acts as a plasticizer — in most cases it can replace equivalent amounts of plasticizer for even lower cost stabilization.

STABILIZER 17-M

Organo-tin sulphur compound. The most powerful stabilizer yet known. Especially effective for rigids as well as for clear films and plastisols.

STABILIZER BC-12

A co-precipitated barium-cadmium laurate. The "old standby." Our most popular stabilizer. Used effectively alone or in combination with our CH-20 or E-49 stabilizers for low cost clears or pigmented stocks.



For more information on these stabilizers, or on the rest of the Advance stabilizer and plasticizer line, write to Advance Solvents & Chemical Corp., 245 Fifth Avenue, New York 16, N. Y.

ADVANCE

SOLVENTS & CHEMICAL CORPORATION

THE PLASTISCOPE

rector of the company's research and development laboratory at Easton, Pa., reports that the laboratory had fabricated some cylinders 8¾ in. diameter by 58 in. long, which had withstood up to 9000 p.s.i. before failure. These are being made for the Navy Dept. on a Bureau of Ships contract.

Tinsel in New Form

MULTI-COLOR tinsels in molding powder are now available for the first time from American Molding Powder and Chemical Corp., 703 Bedford Ave., Brooklyn 6, N. Y. These tinsels consist of various metallic colors in cellulose acetate and metallic, as well as bright red, blue, green, and others in polystyrene. The company has recently changed the names of its large-size tinsel flake molding powders, formerly sold under the name of Stardust, to Confetti.

All Confetti molding powders are compounded from imported metallic tinsel of exceptionally large size and brilliant sparkle which is much more brilliant than the more conventional glass flake generally used.

Further information and samples of the product may be obtained by writing to the company.

Molded Models

HELP for manufacturers in developing better and more precise molds for plastics products is the purpose of the Plastic Tooling Aids Laboratory, 475 Madison Ave., Bridgeport, Conn.

Peter W. Cherry, formerly with General Electric Co. where he was manager of the Appearance Design Dept., is the proprietor. His idea is that the conventional model made of wood or plaster for a plastics product could not possibly be as precise as a model made of plastic. Therefore, he proposes to make the original model in plastic so that its performance in the mold would more perfectly simulate the article which is to be molded in the actual production run.

His method is to obtain from the manufacturer an exact drawing of the item in question. He then pro-

duces a prototype in plastic. After Mr. Cherry's work is completed, he will then present the manufacturer with not only a drawing, but an exact replica of the finished product; he will help select the proper plastic material; give any technical advice needed; and aid in contacting a suitable molder or vender. Mr. Cherry believes that such service will save the manufacturer many hundreds of dollars because both toolmaker and molder will have a much more precise background from which to work.

The model which he produces, Mr. Cherry claims, will save the molder many head-aches. It will show where bossing is necessary; what points need reinforcing; the proper length for screws; and all sorts of details that cannot be properly judged from a wooden or plaster model. In other words, the manufacturer gets a prototype model which shows up possible errors and helps him get quick tooling, lower prices, and less rework time. An example is cited in the model for a customer's radio cabinet where a distortion was discovered that was remedied in advance by providing for a reinforcement to make the result a more structurally sound application.

Mr. Cherry claims that he now has about six different types of resins and many fillers so that he can develop a compound which will simulate almost any type of plastic that the manufacturer wishes to use in his end product. He can work with models as large as 2 ft. square.

Colors for Nylon

NOW available from Acheson Dispersed Pigments Co., a unit of Acheson Industries, Inc., 2250 E. Ontario St., Philadelphia 34, Pa., is a masterbatch dispersion of carbon black in nylon. The new material is a true internal dispersion of black in nylon resin and is not to be confused with the nylon coloring materials heretofore offered which were only mechanical blends of the two finely powdered ingredients, according to Acheson.

The new nylon dispersion, temporarily designated 926XNY16, is

available as a dry granulation in concentrations up to 20 percent. However, according to Gordon E. Cook, sales manager of ADP, masterbatches with a lower concentration of carbon black have proved more popular than the 20% material.

In addition to carbon black, all other colored pigments suitable for use with nylon are available in this same type of dispersion.

25th Birthday for Synthane

THE Ten Year Club of Synthane Corp., Oaks, Pa., honored 440 members, together with their wives and guests, at its annual dinner held in Pottstown, Pa., on April 9.

This year's celebration was a dual-purpose occasion since it marked the 25th anniversary of the founding of the company. Robert R. Titus, company founder and honorary president of the Ten Year Club, presented service awards to 10-, 15-, 20-, and 25-yr. members.

In the beginning, the Synthane plant measured only 150 by 200 feet. During the ensuing years, the plant has gone through 13 major expansion periods. Membership in the company-sponsored club has meanwhile grown to 440, nineteen of whom were among the original 24 members.

Israel Plastics

THE combined capital of a group of America's manufacturers of toys and plastics products are invested in Israel's new \$250,000 plastics factory at Holon, near Tel Aviv.

The Holon plant, which began production early this year, was built by the United States-Israel Plastics Corp. (U.S.I.P.C.O.). The venture was started over two years ago by Alexander Konoff, president of Conmar Products Corp., Newark, N. J., a manufacturer of slide fasteners, and David Rosenstein, president of Ideal Toy Corp., 200 Fifth Ave., New York, N. Y.

Dr. Jacob B. Shohan, organic chemical manufacturer of Newark, N. J., and secretary of U.S.I.P.C.O., coordinates the new firm's activities in Israel. Dr. Shohan described the factory at Holon as "the first section of a plant that has been designed for expansion in multiples of the present facilities."

Machinery includes four extruders, equipment for blowing plastics film, and auxiliary equipment. At

for performance...for profit choose job-designed **WITCO** Plasticizers and Stabilizers

PLASTICIZERS

- WITCIZER 100** (Butyl Oleate—Technical)—for ethyl cellulose, cellulose nitrate, vinyl chloride, polystyrene.
WITCIZER 101 (Butyl Oleate—Premium)—recommended where color and odor are important.
WITCIZER 200 (Butyl Stearate T-1)—plasticizer-solvent in coating compositions.
WITCIZER 201 (Butyl Stearate C-1)—primarily used in cosmetics.
WITCIZER 300 (Dibutyl Phthalate)—high efficiency and compatibility for nitrocellulose lacquers.
WITCIZER 312 (Diethyl Phthalate)—outstanding primary plasticizer for vinyls.
WITCIZER 313 (Di-Iso-Octyl Phthalate)—used interchangeably with 312 (DOP), low viscosity suggests use in plastisols and organosols.
WITCIZER 412 (Diethyl Adipate)—primary plasticizer for vinyls, with excellent low temperature flexibility.

STABILIZERS

- STAYRITE #70** —unusual heat stability, unimpaired clarity, good lubricity.
STAYRITE #80 —liquid, very effective under dynamic heat conditions; i.e., calendering and extrusion, valuable in plastisols and organosols.
STAYRITE #90 —non-toxic. Acceptable for food-wrapping film.
STAYRITE 10 (Lead Stearate #30)—for opaque and semi-transparent compounds. Especially good for electrical insulating materials.
STAYRITE 15 (Lead Stearate #50) (dibasic)—high lead content, heat stabilizer and lubricant for opaque goods.
STAYRITE 20 (Barium Stearate)—for high clarity, color-stable items which come in contact with sulphur fumes.
STAYRITE 22 (Cadmium Stearate)—light stabilizer for transparent formulations.
STAYRITE 25 (Calcium Stearate)—non-toxic. Acceptable for vinyl films for foodstuffs.

WITCIZERS*—plasticizers manufactured by Witco, are produced to the most rigid specifications, thus assuring high quality and purity—and **STAYRITES***, Witco-developed vinyl stabilizers, are tailored to meet your stabilization problems at all times because of their uniformity and effective protection.

And to meet customer needs, answer customer problems, *Witco's* research and technical service laboratories combine wide experience with the most modern and complete facilities. Investigate the advantages offered your products by *Witco* **WITCIZERS** and **STAYRITES** today. Samples available for your evaluation.

*Trade-mark applied for



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present, 20 workers are employed on two shifts producing plastic sheeting, film, tubing, rods, and a wide variety of plastics products for industrial application.

The raw materials, mainly polyvinyl chloride and other resins, are imported from Italy, Germany, and Yugoslavia. The company expects the first year's production to amount to about \$300,000, of which \$100,000 worth of products will be exported.

Big Fire, But Next Door

NEWSPAPER reports that the Cast Optics Corp.'s plant in Riverside, Conn., was destroyed by fire were false, according to William E. Chapman, president of the company. Mr. Chapman says the plant next door, a millworking plant, was burned to the ground, but the firemen saved his building with only minor damage to the office roof. His manufacturing facilities were not affected.

Among other products, Cast Optics produces Cocor CR-39, a cast allyl base plastic with the transparency of glass. The latest application of this material is for eye guards on the grinding machines of Irwin Auger Bit Co., Wilmington, Ohio. They replaced safety glass guards which had reportedly proven wasteful and unsatisfactory because they pitted so easily. An Irwin spokesman said they use only three blanks per machine with CR-39 guards compared to 300 pieces of glass per year per machine previously.

Seiberling's Rigid Vinyl

UNPLASTICIZED (rigid) polyvinyl chloride, which has been produced on a pilot plant basis at Barberton, Ohio, by Seiberling Rubber Co. for over a year, is slated for commercial production when the company's new plastics plant at Newcomerstown, Ohio, is completed this summer. Seiberling expects production capacity of the material, called Seilon, during the first two years of operation to run about 1.5 million lb. annually.

Seilon will be produced at Newcomerstown in 4- by 8-ft. sheets, although it can be made in other forms. Seilon sheets and plates are made by

laminating calendered sheets of the material. The sheets can be joined together by a special "hot gas" welding process. Tubes, pipes, rods, and bars can be produced by extrusion.

When heated, the vinyl sheets can be formed into various shapes with wood, metal, or composition molds, or blown like glass.

One of the first applications for Seilon has been in the production of ventilating ducts that are used to carry away deadly acid fumes from plating tanks at Cleveland Graphite Bronze Co., Cleveland, Ohio. Metal ductwork would not last long, according to Seiberling, because the acid fumes would eat it away.

General Tire Completes Merger

STOCKHOLDERS of The General Tire & Rubber Co., Akron, Ohio, have approved the mergers of Textileather Corp., Toledo, Ohio, and Bolta Corp., Lawrence, Mass., into The General Tire & Rubber Co.

Financial details of the mergers have not been released. The deals were consummated separately in an exchange of General Tire preferred stock for the outstanding common stock of both Bolta and Textileather. Bolta and Textileather posted record-breaking sales in 1953. Bolta's sales amounted to \$19,977,557 and Textileather's to \$19,522,238.

Textileather, which employs 850 persons, produces coated fabrics, plastics film, and coated fiber-base materials for automobiles, upholstering, bookbinding, and many other uses.

Bolta's plants, employing more than 1000 persons in Lawrence, Mass., produce, print, and emboss plastics film and sheeting. A major supplier for the furniture industry, Bolta has done research in many new applications of plastics products, such as wall covering material to replace paneling. The company also has a patented process for producing saran material for use in drapery and upholstery applications, shoe fabrics, hats and luggage, and filter cloths and screens used in the industrial field.

No changes in physical equipment, policies, or management of the two

companies are contemplated. Each will be operated as a division of General Tire. Jules D. Lippman, Textileather's president, will continue to direct the Toledo operation for General Tire. Key personnel of Bolta, including John Bolten, Sr., founder of the company, his son, John, Jr., and Daniel E. Hogan, Jr., will also retain their present connections.

In addition to the Textileather and Bolta plants, General Tire's plastics operations include plants at Jeanette, Pa., and Marion, Ind., and a new \$6 million polyvinyl chloride plant at Ashtabula, Ohio, which is expected to start production early in August.

Quick-Drying Vinyl Ink

ANEW line of quick-drying inks for gravure printing on vinyl film and sheet is now available from Acheson Dispersed Pigments Co., a unit of Acheson Industries, Inc., 2250 E. Ontario St., Philadelphia 34, Pa. This line of inks, which are reported to give superior blocking properties, is a wholly new venture for Acheson. The inks, produced in black, white, and 10 other colors, are claimed to have faster and more complete drying characteristics than other vinyl inks now available.

It has been asserted that the new inks dry so fast that some users may need to slow them down a little. The formulation developed by ADP represents what the company believes is just the right combination of pigment, resin, and solvent to give the desirable blocking qualities for gravure printing on vinyl film and sheet.

According to company officials, the new inks also give greater brilliance than has generally been obtainable in gravure printing.

Burgess Pigments

PIGMENTS which provide improved electrical, physical, and chemical properties that accrue from their calcining process are being suggested for use in the manufacture of insulated wire and cable, vinyl sheeting, synthetic rubber gaskets, and many other products at Burgess Pigment Co., 64 Hamilton St., Paterson 1, N. J.

The improvements in electrical qualities are said to be caused by the addition of anhydrous kaolin type clay pigments to vinyl compounds. Five parts of Pigment No. 30 pro-



Mr. Leo Paszkiet, Supt. of Maintenance
P. R. MALLORY PLASTICS, INC., Chicago, Ill.

Over 10 Months of Efficient 24-Hours-A-Day Production WITHOUT SERVICING FILTERS!

This is the report by Mr. Leo Paszkiet after his experience with

MARVEL SYNCLINAL FILTERS

"We have one injection molding press here that was giving me a lot of trouble. In order to maintain our 24-hour-a-day schedule, I had to stop it every two weeks to service the filters. It was a troublesome, time consuming job but it just had to be done. Even then, the machine never seemed to reach the productive capacity I knew it was capable of. Well, I had enough of that so I pulled out the original 3 filters and replaced them with three Marvel Synclinal Sump type Filters. That was over ten months ago. During all this time the machine was operating faster and smoother than it ever had before. There was no more slow down of production due to pressure loss, vibration, pump starvation, etc. Assuming that the filters were about due for servicing, I took them out and what I saw convinced me they could have stayed there for another two months. Filtered out dirt was evenly distributed over the entire filtering surface and not jammed up in spots that usually cause pressure build-up. I took the filters apart, dipped them in a solvent for one minute, blew them clean and dry with an air hose, put them back together again and back into the machine. The whole operation took about 15 minutes. On the basis of these results, we are installing Marvels on every hydraulic machine in our plant, except of course, those on which Marvel Synclinal Filters were installed as standard equipment by the manufacturer."

For Dependable Protection On All Hydraulic And Low Pressure Liquid Circulating Systems



SUMP TYPE
(Cutaway)

The BALANCED Synclinal Design of Marvel Filters provides that all-important balance between maximum ACTIVE filtering area and sufficient capacity for storage of filtered out particles. In the plants of America's industrial giants as well as in smaller plants, Marvel Synclinal Filters are doing an excellent job protecting machines and increasing production. They are proving their superiority in the one real test—ON THE JOB! Marvel Synclinal Filters operate longer between cleanings, require less maintenance down-time and thereby achieve more production. Not only plant operators and maintenance men, but also over 400 original equipment manufacturers have recognized the superiority of Marvel Synclinal Filters and install them as standard equipment.

EASY MAINTENANCE

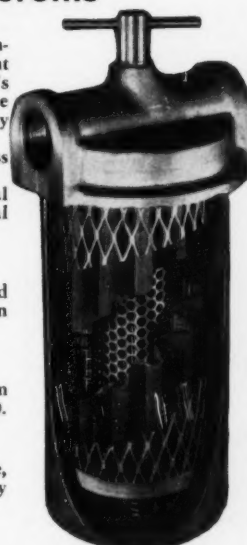
Marvel Synclinal Filters may be easily disassembled, cleaned and reassembled in a matter of minutes by any workman. Line type operates in any position and may be easily serviced without disturbing pipe connections.

A SIZE FOR EVERY NEED

Marvel Synclinal Filters, sump or line type, are available in capacities from 5 to 100 G.P.M. and choice of mesh sizes ranging from coarse 30 to fine 200.

IMMEDIATE DELIVERY

Marvel not only delivers a top grade filter in both quality and performance, but delivers IMMEDIATELY. If desired, shipments are made the same day orders are received.



LINE TYPE
(Cutaway)

WATER FILTERS

In response to the great demand, we have adapted both our sump and line type models for use in all water filtering applications. No changes have been made in the basic Synclinal design.

MARVEL Engineering Company

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Standard



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MP-6

Without obligation, please send complete data on Marvel Synclinal Filters as follows:

Catalog No. 106 for Oil Filters
Catalog No. 300 for Water Filters

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Company
Address
City ZONE STATE

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duce an increase in insulation resistance of almost ten-fold with no significant changes in the physical properties.

Another pigment, called Burgess Iceberg, produces the same qualities as Pigment No. 30 but is extremely desirable where a good white compound is required, with a minimum titanium dioxide percentage composition necessary. The addition of 10% Iceberg is useful in controlling surface gloss of vinyl extrusions.

Fluoroplast

TRADEMARKED Fluoroplast, a new fluorocarbon product has been developed by United States Gasket Co., Camden 1, N. J., and is being produced in molded bars, cylinders, extruded rods, and tubing. The company states that Fluoroplast is priced sufficiently lower than other fluorocarbon plastics to greatly extend the use of this "wonder" material.

Fluoroplast, generally colored green for identification, is 100% tetrafluoroethylene, reprocessed by a method which permits re-utilizing virgin material waste and maintaining its original purity in the refabricated product. Values compiled from test data show that the new product possesses most of the outstanding properties of the virgin material.

For further information and test data, write for the company's Bulletin FL-300.

EXPANSION

National Vulcanized Fibre Co., Wilmington, Del., announces plans for construction of a modern research laboratory to enlarge the facilities of the company's research and development section. **Eugene R. Perry**, president, states that the new laboratory will have a three-fold purpose. It will be used to improve the quality of present products (vulcanized fiber and Phenolite laminated plastic), to develop new uses for these products, and to develop entirely new materials.

The laboratory will be located in Yorklyn, Del., near Wilmington.

Formerly used for storage of the raw materials employed in the manufacture of vulcanized fiber, the building will be completely renovated at an estimated cost of nearly \$¼ million. It will occupy 20,000 sq. ft. of floor space.

One of National's five manufacturing plants in the Wilmington area is also located in Yorklyn.

Koppers Co., Pittsburgh 19, Pa., announces the selection of Port Arthur, Texas, as the site for its new polyethylene plant. At Port Arthur, Koppers will purchase ethylene gas from new ethylene facilities being constructed at the nearby refinery of Gulf Oil Corp.

The new plant will be located on a portion of a 1000-acre site purchased several years ago. Early in 1953, Koppers placed in full production at this site an installation which produces ethyl benzene, which is used in making the company's polystyrene and in synthetic rubber.

Foster Grant Co., Inc., Leominster, Mass., has opened its new petrochemical plant in Baton Rouge, La., for the production of styrene monomer. The company thus becomes the first plastic molder in the United States to establish its own primary supply of raw materials.

The company in 1950 set up its own polymerization plant in Leominster for making polystyrene. With the opening of its Baton Rouge facilities, Foster Grant completes within one corporate structure the entire cycle of production from purchase of refinery materials to the final merchandising of plastics products.

Joseph C. Foster, president, has announced that construction of the Baton Rouge subsidiary will represent an investment of nearly \$4 million. The plant employs certain chemical processes initiated in Germany. Previously, it had been thought that styrene production required a very large plant structure and correspondingly heavy initial investment.

In Foster Grant's compact unit, design emphasis is upon simplification, standardization of equipment,

and a very high degree of instrumentation. With 250 instruments for automatic operation, the plant can be run continuously by a total of only 35 employees. When in full production, its capacity will be in the neighborhood of 2 million lb. of styrene per month. The monomer will be shipped to the company's plant in Leominster to be polymerized.

The plant has been laid out under the supervision of **Dr. F. D. Mayfield**, plant manager, who was formerly in charge of plant process design for Celanese Corp. of America, Chemical Div., Bishop, Texas.

Foster Grant Co. was founded in 1919 by **Samuel Foster, Jr.** and is now under the active direction of his son, **Joseph C. Foster**. The Massachusetts plant employs about 1200 persons. In addition to the company's new Baton Rouge subsidiary, it has affiliates in Canada, Mexico, and Great Britain.

REF Mfg. Corp., 393 Jericho Turnpike, Mineola, N. Y., has established a new division to be known as Poly-Plastics and to be devoted to the production of reinforced plastics and honeycomb structures. The division, which is operating from a plant at 127 Second St., Mineola, will be under the management of **Ernest W. Fuller**, formerly director of staff engineering for American Airlines at La Guardia Field.

Durable Formed Products, Inc., 6 Greene St., New York 13, N. Y., announces that it has added a 9-ft. rapid production vacuum forming press to its existing facilities. The new equipment will be devoted exclusively to the vacuum forming of thermoplastic sheeting, primarily thin-gage material ranging between 1/32 to 1/8 in. in thickness.

Monsanto Chemical Co., Springfield, Mass., has completed a 50% expansion in the production of Salflex vinyl butyral to keep pace with the growing demand for laminated safety glass, particularly in the automotive industry. This is the second production hike in less than a year. The first increase, 20%, was completed in mid-1953. The new addition will enable Monsanto to manufacture more diversified products, including a heavier gage material.

At the same time, it was announced that **Shawinigan Resins Corp.** at Springfield, a Monsanto as-

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work
with

Plastics

you
should
work
with
us...

ATTENTION INJECTION MOLDERS

Have you tried
our crystal clear

PURGING COMPOUND?

*If not, ask for full information and
samples.*

*If you are already a regular user,
better check your inventory and order
today.*

PLASTICS SCRAP

WE BUY

all types of
plastics scrap
and surplus virgin
materials — in any
quantity, large or small.
For top prices be sure to
get our offer every time you
have materials for sale.

WE SELL

reprocessed and virgin plastics
materials of **guaranteed quality**. What
material do you need? ACETATE, BUTYRATE,
POLYETHYLENE, POLYSTYRENE, both regular and
high impact, ETHYL CELLULOSE, VINYLs — they
all are available in reprocessed pellets,
uniform in size, formulated to meet your
color and flow requirements. This
means real savings that count
in today's competitive market.

WE CUSTOM REPROCESS

your own
Plastics Scrap
and Virgin Plastics
Materials. Our 150,000 square feet of floor space
devoted exclusively to the processing of plastics
materials together with our complete laboratory
facilities for testing, analyzing and pilot running enable
us to offer the world's finest facilities for salvaging
plastics scrap and by-products of the plastics industry.

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June • 1954

393

THE PLASTISCOPE

sociate company and supplier of the Saflex raw material, Butvar resin, has increased its production by a similar amount. This added capacity will also make possible the production of increasing amounts of a special laminating plastic interlayer for the aircraft industry and a laminated safety glass for television receiver implosion plates.

COMPANY NOTES

H. N. Hartwell & Son, Inc., 31 St. James Ave., Boston, Mass., announces that Boltaron polyvinyl chloride products are now available to the Canadian market for industrial use wherever corrosion and rough treatment are problems. The company has appointed **Vibra-Lite (Quebec) Reg'd**, Montreal, and **A & A Distributors, Ltd.**, Vancouver, B. C., as distributors of Boltaron.

Hartwell distributes a complete line of Boltaron P.V.C. pipe fittings as well as pipe, sheet, rod, and block stock through 10 fabricators-distributors in the United States.

Celanese Corp. of America, 180 Madison Ave., New York 16, N. Y., announces the following promotions: **David D. Hecht**, formerly director of the Application Laboratory of the Chemical Div. at Summit, N. J., has been promoted to manager of the division's Product Development Dept. **Michael J. Curry** succeeds Mr. Hecht as director of the laboratory. **J. J. MacFarland** has been appointed to the newly created post of assistant to the general manager of the **Plastics Div.** at 790 Ferry St., Newark, N. J. **Donald P. Clarke** has been named manager of plastics sales of Celanese's subsidiary, **Canadian Chemical Co. Ltd.**, and **Hugh Cairns** has joined the company as a plastics sales representative. Both will be at the Toronto, Ont., office.

The Goodyear Tire & Rubber Co., Inc., Akron 16, Ohio, announces the following appointments in its Chemical Div.: **R. E. Workman** has been named assistant to the general manager. He will assist in the coordination of the research, development, production, and sales phases of

the chemical operation. **C. O. McNeer** is now general sales manager and will be in charge of all phases of selling chemical materials, principally to the paint, rubber, plastics, textile, and paper industries. **M. J. Rhoad** has been appointed assistant to Mr. McNeer.

Reed-Prentice Corp., Worcester 4, Mass., announces the election of the following officers:

Frederick W. McIntyre, Sr., president since 1944, has been elected chairman of the board of directors; **Frederick W. McIntyre, Jr.**, former vice president, is now president; **Donald H. Dalbeck**, corporation controller and treasurer, has been named a director and vice president; **Iver G. Freeman**, formerly with Norton Co., Worcester, for 38 years, has been appointed a vice president; and **Eugene T. Connolly** and **Douglas L. Brennen** retain their respective posts as secretary and assistant treasurer.

B. F. Goodrich Co., Akron, Ohio, announces that **William S. Richardson** has been elected president of the company. Mr. Richardson joined BFG in 1926, became president of **B. F. Goodrich Chemical** in 1945, and vice president of B. F. Goodrich Co. in 1952. He is also president of **Goodrich-Gulf Chemical Co., Inc.** **John L. Collyer**, who had been chairman of the board, president, and chief executive officer of B. F. Goodrich Co., relinquished the presidency and was re-elected chairman and chief executive officer.

Lacrinoid Products, Ltd., Gidea Park, Essex, England, has appointed **Holland-America Trading Co., Inc.**, 346 Burns St., Forest Hills 75, N. Y., as its agent in the United States. Lacrinoid produces finishing and polishing materials and equipment for the plastics industry. Customers are invited to send the company unfinished samples so that they can be



Mr. McIntyre, Jr.

finished and polished and then returned with specific recommendations. The equipment has been developed as a result of Lacrinoid's own experiences in the fields of compression and injection molding, extrusion, and fabrication.

The Carborundum Co., Niagara Falls, N. Y., has appointed **F. Jerome Tone, Jr.** senior vice president and **Frederick T. Keeler** director of sales.

Sharpe Plastics, Inc., formerly known as Sharpe Plastics, has moved its office and plant to larger quarters located at South Sudbury, Mass., P. O. Box 247.

The General Industries Co., Elyria, Ohio, announces that the following changes have been made in its **Plastics Div.** over a period of several months: **W. E. Foster** has been named manager of the division; **Morris Bar-chard**, assistant manager; and **J. M. Callihan**, sales manager. **Stan Leonowich**, formerly assistant chief engineer, is now plant manager of the company's Marysville, Ohio, injection molding plant. **Delbert Larrick**, formerly with Continental Can Co.'s Plastics Div., has joined the organization as a production engineer.

The Dow Chemical Co., Midland, Mich., reports that **E. E. Chamberlin**, supervisor of plastics sales at the St. Louis, Mo., office since 1944, has been transferred to Dow's headquarters in Midland to take over the sale of fabricated saran products, including saran-lined pipe and valves. **Bennett M. Coons**, formerly molding materials salesman at the Chicago office, succeeds Mr. Chamberlin at the St. Louis office.

Campro Sales Co., Canton, Ohio, producer of plastics and metal products in the houseware, hardware, and stationers' fields, has appointed the following representatives to cover the Western market: **R. Stanley Bunker**, 1863 Wazee St., Denver 2, Colo., will cover Colorado, Wyoming, Montana, and New Mexico; **Charles Stoddard**, Salt Lake City, Utah, will handle Utah, Idaho, and Arizona; **James H. Dissman**, 403 Merchandise Mart, 712 S. Olive St., Los Angeles, Calif., will represent the company in southern California and Las Vegas, Nevada; **James C. Anderson**, 547 Western Merchandise Mart, 1355 Market St., San Francisco 3, Calif., will handle northern

California and Reno, Nevada; and **Phillip M. Smith**, 6500 Fifty-seventh Ave., N. E., Seattle 5, Wash., will cover Oregon and Washington.

Jiffy cabinets, small-item storage cabinets of steel with clear styrene drawers, will be featured by the entire company's staff.

B. F. Goodrich Chemical Co., Rose Bldg., Cleveland, Ohio, has named **Roger C. Bascom** field sales manager and **Fred L. McNabb** technical service manager of the Hycar and Rubber Chemicals Dept. Mr. Bascom joined BFG Chemical in 1943 as the New England sales representative after long experience in the rubber industry. Mr. McNabb joined BFG Co. in 1935.

The Formica Co., Cincinnati 32, Ohio, has elected **D. J. O'Connor** chairman of the board and named **D. J. O'Connor, Jr.** president of the company.

Carbide and Carbon Chemicals Co., a Div. of Union Carbide and Carbon Corp., 30 E. 42nd St., New York 17, N. Y., has opened a new sales division at 3615 Olive St., St. Louis 8, Mo. **F. J. Rauscher**, who was district sales manager of the St. Louis sales office, has been named division sales manager of the new division.

Additional appointments made by Carbide and Carbon Chemicals are as follows: **H. L. Harwell** has been named district sales manager of the St. Louis district; **J. W. Ross**, district sales manager of the Pittsburgh, Pa., district; **J. R. Hulten**, district sales manager of the Philadelphia, Pa., district; and **J. F. Luther**, district sales manager of the Albany, N. Y., district.

H. Muehlstein & Co., Inc., 60 E. 42nd St., New York 17, N. Y., announces that its newly built research, testing, and quality control laboratory has been opened at its Jersey City, N. J., plant. It is the largest of the company's three laboratories. Besides conducting its own research, the new laboratory will examine and test the findings of the company's other two laboratories in Chicago and Indianapolis.

Zenith Plastics Co., Gardena, Calif., has consolidated all of its aircraft engineering and fabrication facilities into a new division, called **Zenith Aircraft**. The company recently revealed that it is producing

plastic fuselage assemblies for Lockheed P2V5 Neptune bombers, as well as a series of radar housings for the Navy WV-2 and Air Force RC 121C Constellation, reported to be the largest reinforced plastics moldings fabricated to date.

Officers of Zenith Aircraft appointed are as follows: **Frank E. Wallis**, vice president of sales; **Charles Brucker**, vice president of procurement; **William E. Braham**, vice president of engineering; and **Floyd H. Huhn**, vice president of manufacturing.

The Projectile & Engineering Co. has formed a separate sales organization to be known as **Peco Machinery Sales (Westminster) Ltd.**, 28, Victoria St., S.W.1, London, England. Peco will sell and distribute the company's injection molding machines, extruders, and auxiliary equipment for the plastics industry.

Directors of the sales company are



Mr. Chambers Mr. Gaspar Mr. Lees

A. J. Chambers, **M. Freund**, and **E. Gaspar**. **L. W. Lees** has been named sales manager.

Dec-Art Process Co., Inc., 349 Canal Place, New York 51, N. Y., is a newly formed company specializing in silk screening, spraying, and hot stamping on plastics and metal.

Nopco Chemical Co., Harrison, N. J., has elected **Thomas A. Printon** chairman of the board. He retains the office of presidency which he has held since 1949. Mr. Printon succeeds **Charles P. Gulick** as chairman of the board.

Nopco also announces the appointment of **Richard F. Spain** as Midwest district sales manager.

Omnitex Metalizing Corp., 462 Tenth Ave., New York 18, N. Y., has liquidated its business and is now associated with **Irwin Industries,**

Inc., 440 S. Washington Ave., Dunellen, N. J. **Leonard Greenfield**, formerly connected with Omnitex, has joined Irwin Industries.

Tempil Corp. has consolidated all its facilities, including office and shipping, at 132 W. 22nd St., New York, N. Y., where only the plant and laboratory were previously located.

The Richardson Co. has moved its Lockland office to Twenty-seventh Ave. & Lake St., Melrose Park, Ill. The change of address also includes the Lockland office of The Richardson Co. of California.

Resistoflex Corp., Belleville, N. J., has elected **Joseph F. Gentile** and **Irving D. Press** vice presidents of the company. Mr. Gentile will continue as treasurer with partial responsibility also for manufacturing operations. Mr. Press, who will be vice president of engineering, developed the company's new fluorocarbon hose, adapted especially for lubrication and fuel systems of jet aircraft but also having a wide range of potential industrial applications.

Metro-Altantic, Inc., Centredale, R. I., announces the appointment of **Henry Papini** as executive vice president of the company. Mr. Papini, who operates from Greenville, S. C., was formerly vice president of Metro-Atlantic.

The company also announces that plans are being made for the construction of a manufacturing plant in the South and for the expansion of the main plant in Centredale, R. I.

American Vinyl Corp., dealers in reprocessed and scrap plastics, has moved to 73-30 Grand Ave., Maspeth, N. Y.

R. M. Hollingshead Corp., Camden, N. J., announces that its vice president, **Otto J. Blank**, who is a newly elected president of the South Jersey Manufacturer's Assn., will direct the company's newly created development and expansion program. He had been plant manager since 1943. The company is planning a broad expansion program in the United States and Canada. The only

THE PLASTISCOPE

part of the program announced so far is the building of a new plant at Sunnyvale, Calif.

Russell E. Plum, formerly production manager, succeeds Mr. Blank with the title of general manufacturing manager. Mr. Plum joined the company in 1945 as foreman of a manufacturing department. Appointment of **George Abraham** as plant production manager and **William J. Boyd** as plant operating manager has also been announced.

Industrial Plastics Service & Supply Co., 631 S. Victory Blvd., Burbank, Calif., has named **Clyde Maddox** general manager. The company specializes in the supply of adhesives, mold releases for both porous and non-porous molds, strippable coatings, and spray mask materials.

Du Pont, Wilmington, Del., announces that **Dr. Charles W. Winter**, **Frank H. Sawyer**, and **E. Turner Darden** have been transferred from the Research Div. of its Polychemicals Dept. to the Polychemicals Sales Service Laboratory at Arlington, N. J. **Ernest C. Grabill**, a chemical engineer in the Polychemicals Research Div., has been transferred to the Sales Div. of that department.

Barrett Div., Allied Chemical & Dye Corp., 40 Rector St., New York 6, N. Y., has made the following appointments: **Cass Cislo** has been named assistant sales manager in charge of sales of phthalic anhydride, maleic anhydride, and fumaric acid; **A. G. DeMeurisse**, assistant sales manager in charge of sales of phenols and other tar acids, tar bases, and niacin; and **J. E. Shand**, assistant sales manager in charge of sales of plasticizers, Cumar resin, naphthalene, and rubber compounding materials.

Gries Reproducer Corp., 795 E. 132nd St., New York 54, N. Y., has made the following appointments: **Carl L. Chase** has been named sales manager and **Jack Maher**, assistant sales manager and advertising manager; **Peter White** is now manager of the Order Dept., and **Jack J. McDermott**, sales department engineer. **Edward L. Brancato** assumes the

duties of sales correspondent. All will work with **Joseph Saks**, who, as director of sales, heads the Sales Div.

Morningstar Corp., 156 Sixth St., Cambridge, Mass., announces that **Albert J. Gottlieb** has joined the sales staff as representative in New England and New York and **Robert J. Boyden** as development engineer. Mr. Gottlieb, formerly affiliated with E. B. Kingman Co. and Commonwealth Plastics Corp., has had 30 years of experience in the plastics field. Mr. Boyden was formerly associated with the Canopy and Laminite Div. of Goodyear Aircraft Corp.

Metal & Thermit Corp., 100 E. 42nd St., New York 17, N. Y., has made the following appointments: **Frank J. O'Brien, Jr.** has been named general sales manager. Mr. O'Brien came to Metal & Thermit in 1951 as manager of its Scrap Div. **John B. Tinnon**, formerly vice president and general sales manager, continues as chief executive sales officer of the company, including general administration and planning and programming for company expansion. **Harry W. Buchanan, Jr.**, former assistant sales manager of the Chemical Div., is now sales manager of the division.

Cadillac Plastic Co., 15111 Second Ave., Detroit 3, Mich., has appointed **Lloyd R. Marentette**, former sales manager, as vice president in charge of sales. He will direct sales for the plastic materials division that includes sheeting, rods, and tubing, as well as the new Cadco division, which produces cast acrylic rods and tubes under special license from Du Pont.

The company was organized in 1946 by **Robert** and **Richard Jacob** as a warehouse and large supply source for Plexiglas, Vinylite, nylon, and acetate. Cadco cast acrylic rods and tubing are mass produced in a new modern plant completed last year.

Artag Engineering Corp., Chicago, Ill., has purchased **U. S. Plastics Corp.**, 2853 Irving Park Rd., Chicago. All equipment and facilities at U. S.

Plastics have been turned over to **Artag Plastics Corp.**, which has been recently formed. Officers of the new organization are as follows: **Arthur Weis**, president of Artag Engineering, has been named president and treasurer; **Le Roy T. Kinder**, vice president; and **James G. Culbertson**, secretary. Mr. Kinder, who was formerly associated with Elmer E. Mills Corp., will be in charge of operations under the new management. All former U. S. Plastics personnel will be retained. Artag Plastics will render a complete service in injection molding of all thermoplastic materials.

Victory Mfg. Co., 1722 W. Arcade Place, Chicago 12, Ill., has appointed **Laurence M. Boehme** superintendent of molding operations and **Raymond C. Lofthouse** chief industrial engineer.

Bolta Corp., Lawrence, Mass., is the new name of the company under which The Bolta Co., Bolta Products, Inc., Bolta Products Sales, Inc., and Bolta-Saran, Inc., have merged.

W. C. Hardesty Co., Inc., has moved its main offices to new and larger quarters at 25 Main St., Belleville 9, N. J.

Kemtek Corp., 206 Sylvan Ave., Newark 4, N. J., has formed a new division for vacuum formed products. **Al Thomas**, formerly with Bendix Aviation Corp., Teterboro, N. J., will be general manager of sales and services of the new division.

Robbins Tool & Die Co., 1430 Mishawaka St., Elkhart, Ind., specializing in all types of plastics extrusion, dies, and accessories, has formed a new subsidiary, **Robbins Plastics Extrusion Development Laboratory**. The new unit will have a complete service covering plastics extrusion dies and accessories. **Kenneth Robbins** has been named president of the new company; **D. V. Blatter**, vice president and general manager, as well as general manager of Robbins Tool & Die Co.; and **V. L. Robbins**, secretary and treasurer.

M. Holland Co., broker of plastics scrap materials, announces that it has moved its plant and offices to larger quarters located at 225 N. Racine Ave., Chicago 7, Ill. The company also announces the formation of **Plastic Service, Inc.**, under the

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technical direction of **Jacob B. Gitner**. The new firm will have complete facilities for compounding and coloring of virgin acetate and styrene materials, as well as reprocessing facilities for all thermoplastic materials.

W. R. Grace & Co., 60 Beaver St., New York 4, N. Y., reports that its board of directors and **The Davison Chemical Corp.**'s board of directors have approved a merger of Davison into the Grace company, and have recommended the merger for favorable consideration by the stockholders of the two companies.

Strick Trailer Co., Whitaker & Godfrey Aves., Philadelphia, Pa., announces the formation of a **Plastics Div.** **Louis A. Kandle** has been named executive production director of the new division. Mr. Kandle formerly owned and operated metal fabrication plants in Philadelphia and expects to adopt metal working techniques to certain aspects of plastics fabrication.

Wilmod Co. Plastics Div., 2488 Dufferin St., Toronto 10, Canada, announces that the Windsor Autoplas, fitted with single stage multi-screw pre-plasticizer unit, will be shown for the first time in North America at the Canadian International Trade Fair May 31-June 11.

PERSONAL

George M. Walker, 47, has been elected vice president and general manager of the **Chemical Div., Koppers Co., Inc.**, Pittsburgh 19, Pa. He succeeds the late Dan M. Rugg. Mr. Walker has been with Koppers since he graduated from Virginia Military Institute. He started as a draftsman in the Pittsburgh offices and assisted in the design of chemical-recovery equipment. Mr. Walker was executive assistant to the manager of the wartime division of Koppers which operated a styrene and butadiene plant at Kobuta, Pa. In 1951, after



George M. Walker

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the wartime Butadiene Div. had become the basis for the present Chemical Div., Mr. Walker returned to that division as an assistant vice president and his special job has been to map and assist in directing the expansion of that division.

Ralph Winslow, former manager of the company's Public Relations Dept. since 1947, has been named a departmental vice president of Koppers. Mr. Winslow is a chairman of the Industrial Advertisers Advisory Committee of the Association of National Advertisers, a member of the board of directors of the Advertising Federation of America, and a member of the Public Relations Advisory Committee of the Manufacturing Chemists' Assn. He is also president of the Pittsburgh Advertising Club and a member of the board of directors of the Pittsburgh Chapter of the Public Relations Society of America.

George Field has been appointed manager of the Marietta, Ohio, plant of **B. F. Goodrich Co.'s Industrial Products Div.** He succeeds **Robert Price** who has resigned. Mr. Field joined BFG in 1942 as production manager and was later plant manager of the GR-S American rubber plant operated for the Government by BFG in Louisville, Ky. He was transferred to Cleveland in 1947 as technical manager and coordinator of all GR-S plants operated by B. F. Goodrich Chemical Co.

T. W. Sharp has been appointed manager of the newly created **Flexible Packaging Materials Div.** of **Bakelite Co.**, a Div. of **Union Carbide and Carbon Corp.**, 260 Madison Ave., New York 16, N. Y. The division will assume sales and technical service of all Bakelite polyethylene sold for extrusion of unsupported thin film, as well as vinyl cast film and vinyl-coated paper for flexible packaging applications.

Dr. Oliver W. Cass, assistant laboratory manager of **Du Pont's** electrochemicals department at Niagara Falls, N. Y., has won the 1954 **Jacob F. Schoellkopf Medal** of the American Chemical Society's Western New York Section. Dr. Cass was cited for his work in developing the process for adiponitrile—a substance used to make nylon from furfural. The

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THE PLASTISCOPE

award also recognized his important contributions to chlorinated hydrocarbon processes such as those for making butadiene and chloroprene. During World War II, chlorine research by Dr. Cass hastened the availability of DDT in quantity by many months. Some of the first work in this country on caprolactam—used to produce another type of nylon—was done by Dr. Cass. His work is covered in part by six publications, 65 patents, and more than 200 company reports.

James R. Turnbull, Seattle, Wash., assistant general sales manager of **Monsanto Chemical Co.'s Plastics Div.**, has been appointed as one of five members of a survey team to study the Fish and Wildlife Service of the Department of the Interior, Washington, D. C.

Allan G. Butler has been named assistant to the manager of the **Laminating Materials Div., Bakelite Co.**, a Div. of **Union Carbide and Carbon Corp.**, 260 Madison Ave., New York 16, N. Y. Mr. Butler joined the company in 1936. Prior to his appointment, he was a technical representative of the Laminating Materials Div.

Hal Mirvins has been promoted to general manager of **S & W Moulding Co.**, Parsons & Reinhard Ave., Columbus, Ohio. Mr. Mirvins joined the company in 1947 as a special representative and was named sales manager in 1948.

Clifford W. Brown, formerly factory manager, has been appointed vice president and a director of **Narmco Resins & Coatings Co.**, Costa Mesa, Calif. Mr. Brown was previously plant superintendent of **Irrington Varnish & Insulator Co.'s Western Div.**

L. Spiwak has resigned from **Snyder Chemical Corp.** and is now plastics engineer of **Rogers Corp.**, Good-year, Conn.

W. Wendell Drummond, for the past 14 years engaged in basic and applied research with **Owens-Corning Fiberglas Corp.**, has joined **Bjorksten Research Laboratories, Inc.**, Madison, Wis. Mr. Drummond has specialized in fiber-forming opera-

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tions for the past six years and is the author of some 20 patents and patent applications.

F. F. Ogden of Dickinson, Texas, has been promoted to assistant director of development of **Monsanto Chemical Co.'s** **Plastics Div.** He will remain at his present location, the division's plant at Texas City, and will report to **Reid G. Fordyce**, director of development and technical service at the division's headquarters in Springfield, Mass. Mr. Ogden joined Monsanto in 1935 as a research chemist at the company's plant in Everett, Mass.

Erhart K. Drechsel has joined the Market Research Dept. of **American Cyanamid Co.**, 30 Rockefeller Plaza, New York 20, N. Y. Formerly with the Research Div., Stamford Laboratories, Mr. Drechsel's main interests have been in the polymer and resin field. Most recently he was responsible for the Polyester Research Program.

Laurence B. Henriques is now vice president of **J. B. Henriques, Inc.**, 521 Fifth Ave, New York 17, N. Y. Mr. Henriques has for the past 10 years been assistant secretary and assistant treasurer of The Presbyterian Hospital at the Columbia Presbyterian Medical Center, 622 W. 168th St., New York, N. Y. Prior to that time, he was for many years assistant manager of Kidder, Peabody & Co.

The company was formed in 1953 and was appointed the sole distributor in this country for **Imperial Chemical Industries, Ltd.'s** **Plastics Div.** J. B. Henriques, Inc. also took over the Resale Chemical Dept. of **Arnold, Hoffman & Co., Inc.**, Providence, R. I.

Frederick M. Murdock has been appointed an assistant director of the Patent Dept., **Monsanto Chemical Co.'s** **Research and Engineering Div.**, St. Louis, Mo. Mr. Murdock, who has been in charge of patent work for the company's Organic Chemicals Div. since January 1949, joined the Fiberloid Co., Springfield, Mass., in 1932 before it was acquired by Monsanto. He has been with Monsanto

since that time, and was a member of the Plastics Div.'s Patent Dept. from 1940 until 1949.

G. E. Traumueller is now treasurer of **Lunn Laminates, Inc.**, Huntington Station, N. Y., and Ashtabula, Ohio.

Lawrence N. Holden, Jr. has been named New England representative of **Pittsburgh Coke & Chemical Co.'s** **Plasticizer Div.** He was formerly plasticizer sales representative, operating from the Cleveland, Ohio, office.

Dixon C. Van Winkle has been appointed manager of the Chemicals Dept. of **Atlas Powder Co.'s** New York office at 60 E. 42nd St., New York 17, N. Y.

Joseph Schneider is now director of engineering of **Thomas Mfg. Corp.**, 80 Clinton St., Newark 5, N. J. A member and past officer of The Society of Plastics Engineers, Mr. Schneider has specialized in the fields of plastics engineering and mold, die, and tool design.

Sam F. Rutland, Jr. has joined **Flexible Product Co.'s** **Plastic Mfg. Div.**, Marietta, Ga., as plant manager. He was formerly affiliated with **Merck & Co., Inc.**

William B. Wilkins, reinforced plastics engineering consultant of Ridgewood, N. J., attended the President's Conference on Occupational Safety at the Departmental Auditorium, Washington, D. C., from May 4-6 at the invitation of the President of the United States.

Peter E. Devis, president of **Davis Color & Chemical Co., Inc.**, 185 Christopher St., New York 14, N. Y., who was injured in a taxicab accident several months ago, reports that he is now well on the road to recovery and expects to return to serving his customers again within a short time.

Dr. Frank W. Hightower has joined the **Ultrasonic Power Div.**, **Branson Instruments, Inc.**, 194 Richmond Hill Ave., Stamford, Conn. His responsibility will be the development and adaptation of high power ultrasonic energy generators to

Modern Plastics

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chemical plant processing. Dr. High-tower has had a life-time of experience with industrial chemicals, production, research, and development, plus experience in using ultrasonics to further and accelerate chemical operations.

Deceased

Dan M. Rugg, vice president of **Koppers Co., Inc.** and general manager of its Chemical Div., died unexpectedly from complications following surgery. Mr. Rugg joined the company in 1926 as a sales engineer; in 1952 he was named vice president of Koppers' Butadiene Div., which later became the basis for formation of the Chemical Div.; in 1946, he was named vice president and general manager of the Chemical Div.

Pierre Samuel du Pont, industrialist, philanthropist, and head of the Du Pont family, died unexpectedly at the age of 84. He was president of E. I. du Pont de Nemours & Co., Inc. from 1915 to 1919 and chairman of the board until 1940.

In 1915, Coleman du Pont offered to sell his Du Pont stock. A group led by Pierre du Pont purchased the shares, forming Christiana Securities Co. Pierre du Pont was elected president of Christiana and held that position until May 1950, when he was succeeded by his brother, Lamont du Pont. Coleman du Pont resigned as president of Du Pont Co. and in 1915, Pierre du Pont succeeded him, becoming also chairman of the finance committee.

Joe Fiedler, first president and co-founder of **F & F Mold & Die Works, Inc.**, 103 Sachs St., Dayton 3, Ohio.

MEETINGS

June 7-10—Society of the Plastics Industry, Sixth National Plastics Exposition, Public Auditorium, Cleveland, Ohio.

June 16-18—The Committee on Vacuum Techniques, High Vacuum Symposium, Berkeley-Carteret Hotel, Asbury Park, N. J.

July 12-16—National Housewares Manufacturers Assn., Twenty-first National Housewares Exhibit, Auditorium, Atlantic City, N. J.

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Colton 2RP and 3RP Rotary & 4T Tablet Machines. J. H. Day Rotex, Tyler Hammer, Selectro, Robinson, Great Western Sifters, Mikro Bantam, I.S.H. 2TH, 3W, 4TH Pulverizers; Schutz O'Neill Mills, Baker Perkins Heavy Duty Steam Jacketed, Double Arm from 12 to 200 gal. Mixers (Unidor and Vacuum also). J. H. Day, from 4 up to 100 gal. Imperial and Cincinnati D. A. Jacketed, Sigma Blade Mixers, Day & Robinson Dry Powder Mixers, 100 up to 10,000 lbs. Patterson 25 cu. ft. Double Cone Blender, Package Machy, FA, FA4, Miller, Hayssen, Scandia, Oliver auto. Wrappers. **REBUILT AND GUARANTEED**—This is only a partial list. Over 5000 machines in stock—available for immediate delivery. Tell us your machinery requirements. UNION STANDARD EQUIPMENT CO. 318-322 Lafayette St., New York 12, N.Y.

SAVE WITH GUARANTEED REBUILT EQUIPMENT: Hydraulic Presses: 2 new R.D. Wood 500 ton 54"x26" platen, 42"x37", 20" ram, 475 tons; 2-7 opening 27"x27", 18" ram, 565 tons; 24"x24" 12" ram, 170 tons; 24"x20" 10" ram, 118 tons; 20"x20" 10" ram, 118 tons; 20"x20" 10" ram, 200 tons; 30"x20" 8" ram, 75 tons; 24"x20" 8" ram, 75 tons; 14"x14" 8" ram, 75 tons; 15"x15" 8" ram, 75 tons; 2-19"x24" 10" rams, 78 tons; 12"x12" 6 1/2" ram, 50 tons; 14"x14" 8" ram, 50 tons; 8" x 9 1/2" 4 1/2" ram, 50 tons; 16"x16" 3 1/2" rams, 12 tons; PREFORM PRESS: Colton 5 1/2 T. Reeves Drive and Motor; LABORATORY PRESSES: Carver & Watson Stillman Units; NEW UNIVERSAL DUAL PUMPING UNITS: 3-15 HP; NEW LABORATORY MILLS, and CALENDERS; EXTRUDER: Modern Plastic 1 1/2"; ACCUMULATOR: HPM 6" ram 2500 #, also Mixers, Vulcanizers, Injection Molding Machines, etc. UNIVERSAL HYDRAULIC MACHINERY CO. INC., 285 Hudson Street, New York 13, N.Y.

FOR SALE: 1—F.B. 32"x92" inverted-L4 Roll Calendar, red. drive, d.c. vari-speed motor. 1—National Erie 8"x24" 2 Roll Mill, 10 HP motor; 1—S. B. 8"x18" 3 Roll Calendar, 20 HP motor. 2—Hydraulic Presses, 7 heated platens—1—French 42"x42", 20" dia. ram, 1—Southark 48"x48", 4—12" dia. rams; 1—National Erie 8" Strainer, 75 HP motor; 2—Colton 5 1/2 T. Preform Presses; 1—Royle No. 4 Extruder, M.D.; 1—F.B. 6"x13" self-contained 3 Roll Calendar M.D. 1—6"x12" Lab. Roller Mill; 1—Reed-Prentice 4 oz. Model 10A Injection Molding Machine; 1—No. 1 Banbury Mixer; 7—Dry Mixing Blenders up to 5,000 lbs.; 3—Micro Pulverizers; 2—Ball & Jewell Cutters; 1—Kux Model 50 Preform Machine. Also Grinders, Extruders, Pulverizers, Baker Perkins Mixers, Screens, Kettles, etc. Send us your inquiries. We buy your idle machinery. MODERN PLASTICS PRODUCTS CO., INC., 50 Bloomfield Street, Hoboken, N.J. HOboken 3-4425. N. Y. Tel.: BArcley 7-0600.

KUX MODEL 25 AND STOKES RD3 Rotary Presses: B & J Rotary Cutters #1 1/2 and Standard Ideal; Mikro Pulverizers Bantam, #1-SH, #2-SL, #2-TR; B.P. 50 HP, 50 gal. Sigma Blade Jacketed Mixer; W & P 100 gal. Mixer and 1 qt. and 10 gal. Stainless Steel Mixers. Large stock steel and stainless steel tanks and kettles. PERRY EQUIPMENT CORP., 1429 N. 6th Street, Philadelphia 22, Pa.

FOR SALE: Injection Presses: 4, 8, 16, 22 oz. Reeds, 4, 9, 16 oz. HPM, 15 oz. Crown Moldmaster, 1 oz. Vandrom. Scrapgrinders, Ovens, Compression & Transfer presses: 50, 100, 250 tons. Stokes Automatic 50 tons 235A & Standard Transfer 258, 42" Sittling & Rewind machine, 3 HP Gasblowers, 20 KW Preheater. —Preform presses, McBeth Daylite Testbooth. Several good Houseware Injection molds. List your surplus equipment with me. JUSTIN ZENNER, 823 Waveland Ave., Chicago 13, Ill.

HYDRAULIC PRESSES rebuilt, repaired. Used presses from laboratory to 1000 tons standard and special, molding and hobbing presses, etc. Used pumping units up to 10,000 p.s.i. all capacities. CLIFTON HYDRAULIC PRESS CO., 291 Alwood Rd. P.O. Box 325, Clifton, New Jersey.

FOR SALE: 1 Model MD 3A Megatherm Dielectric heater complete with large traveling oven. Reply Box 1837, Modern Plastics.

KINNEY HIGH VACUUM PUMP—One new DVD-14-14-18, 500 CFM high vacuum pump complete with separator tank, 25HP motor, V-belt drive, two solenoid valves, starter and push-button station for 220/3/60 operation. Actual operating time less than 30 hours. New price \$4500.00, our price \$3000.00. Subject to prior sale. WELLS SPECIALTY CO., INC., North Liberty, Indiana. Phone 90.

FOR SALE: 1—3 1/2" NRM Oil Heated Extruder with Reliance Drive; 1—Mill, 14" x 42" Rolls, Motor and Drive; 1—2000 lbs. Stainless Steel Ribbon Blender; 1—Ball and Jewell Size #1 Grinder; 3—20" Island Extruder Conveyors; 1—Dings Magnetic Separator; also miscellaneous auxiliary equipment. Inspection invited. Reply Box 1842, Modern Plastics.

FOR SALE: Hobbing Press 800 Ton W.S. (2) 300 Ton W.S. Presses 20x20 & 25x24 Platens. 140 Ton W.S. 22x16 Platen. 85 Ton Waterbury Farrel 20x24 Platen. 9, 8, 4 Oz. Injection Molding Machines. Ball & Jewell Plastic Grinders. Standard Mystic Embossing Presses. Accumulators, Pumps, Valves. AARON MACHINERY CO., INC., 45 Crosby St., New York 12, N. Y. Tel. WOrth 4-8233.

FOR SALE: 1 only—Two (2) ounce Van Dorn Injection molding machine: Model H-200, Press lever operated: 8"x8" Platen area; 6" opening: Used approximately 500 hours in research laboratory. Excellent condition. Reply Box 1816, Modern Plastics.

WE HANDLE HYDRAULIC PRESSES, pumps and power units of all sizes. Write us your requirements and we will try to help you. We find it impossible to list our equipment in this classified column due to the fact that the equipment is sold before ad is published. For those who seek action look in the New York Times under the Machinery and Tool Column for our regular Sunday Special. HYDRAULIC SAL-PRESS, INC., 386-90 Warren Street, Brooklyn 2, N. Y. MAin 4-7847.

FOR SALE: 1—34" Fibre Glass Preformer complete with oven, etc. Excellent Shape. 2—2 lb. LaRone Preheaters, 6 mo. service. 1—250-ton HPM Compression Press complete with top transfer cylinder & pumping unit. 2—2 can 10 lb. Rotary Electrical Preheaters. 3—4 can 10 lb. Rotary Electrical Preheaters. SPERZEL COMPANY, 2845 Harriet Ave., Minneapolis 8, Minnesota.

FOR SALE: Warner Laminating Press, practically new, 5"x7" press platens, manually operated. Suitable for plant identification. Will supply full instructions on how to operate. Machine privately owned. With plastic materials—cost \$300. Reply Box 1824, Modern Plastics.

FOR SALE: Embossing Machine for plastic film, light or heavy gauge. Can be used for laminating and polishing. Rolls 60" face with dual let off and dual take up. Equipped with friction clutches, preheating electric controlled. T & M MACHINE & TOOL CO., 29 Greenpoint Avenue, Brooklyn 22, N.Y. Tel.: EV 9-1564.

FOR SALE: 1 Sprout-Waldron 1000 # as jacketed ribbon blender, MD. 1—10" x 20" 2-roll plastic mill M.D. 1 Royle #2 oil heated plastic extruder, 2 Ball & Jewell rotary cutters, 1 and 5 HP. CHEMICAL & PROCESS MACHINERY CORP., 146-148 Grand Street, N. Y. C. Tel.: WOrth 6-3430.

FOR SALE: 1 Reed-Prentice 5A-4 oz. Injection Press—April, 1951—Serial 60232. Complete with spare heating chamber. SANTAY CORPORATION, 351 N. Crawford Ave., Chicago, Illinois.

MACHINERY and EQUIPMENT WANTED

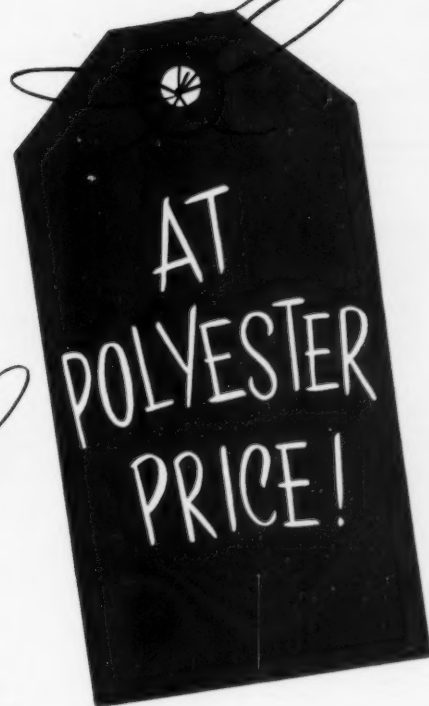
WANTED: Racine pumping unit complete with all valves and fittings. Require #6 Pump with 5-1 booster and solenoid operated four-way valve. All valves to have one inch pipe openings. Reply giving full details to Box 1809, Modern Plastics.

(Continued on page 404)

Modern Plastics



THESE PREMIUM QUALITIES




ATLAC® dry polyester resins stand out far above other polyesters in smoothness of finish, low shrinkage, and high interlaminar strength . . . yet their cost compares with the usual polyesters. *They're a different kind of resin, made from materials common to both epoxys and polyesters.*

Supplied as 100% dry powdered resin, for long shelf life, uniform cure. Used in "pre-preg" cloth or mat, and "pre-mix" molding compounds.

They improve plastisols and rubber formulas, and are used in preparing mineral filled molding powder for electrical parts of high stability to heat and humidity. Cross-linking monomers can be varied for special effects.

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offices in principal cities
ATLAS POWDER COMPANY,
CANADA, LTD.
BRANTFORD, CANADA

CLASSIFIED ADVERTISING

(Continued from page 402)

HYDRAULIC PRESS WANTED

With Pullbacks
12" to 14" Ram Size, 3000 lbs. water pressure, Minimum stroke 20". T Slots in Head & Platen, Minimum opening 40". Die Area at least 25" wide x 25" deep.
DIEMOLDING CORPORATION
Canastota, New York

WANTED: Plant or Machinery including Rubber Mills, Hydraulic presses, Sturdy mixers, Calenders, Banbury mixers, Pulverizers, Grinders, Rotary cutters, Extruders, Screens, Injection Molding machines, Dryers, CONSOLIDATED PRODUCTS CO. INC., 50 Bloomfield Street, Hoboken, N.J. Hoboken 3-4425, N.Y. Tel.: BARclay 7-0600.

WANTED: Banbury Mixers, Heavy Duty mixers, Calenders, Rubber Rolls & Mixers, Extruders, Grinders & Cutters, Hydraulic Equipment, Rotary and Vacuum Shear Dryers, Injection Molding Machines. Will consider any operating or shut down plant. P. O. Box 1351, Church Street, New York 8, N. Y.

WOULD LIKE TO PURCHASE used late type Slush Molding and Heat Sealing Equipment. Reply Box 1819, Modern Plastics.

MOLDS FOR SALE

FOR SALE AT GREAT SAVINGS

Three Molds for production of Plastic Containers. These molds are hardened steel, and may be annealed and reworked. They may be used in Phoenix-Lester Machine, twelve ounce capacity. The overall sizes are 23 1/2" x 18" x 11 1/2"—18" x 16 1/2" x 11"—18" x 16 1/2" x 12 3/4", with pushup plate 6" in length 11 1/2" in width. They produce containers of following dimensions—5 7/8" x 4 1/2" x 1 1/4"—4 3/4" x 4 3/4" x 1 1/4"—round dia. 5" x 7/8". Samples of containers, and price of molds furnished on request.
R. R. PRESSEL SAUSAGE CO.
8800 Conant, Detroit 11, Michigan

TOY MOLDS. Eastern molder has molds for toys that have had fair Eastern coverage. Excellent volume could be generated with aggressive merchandising. Wonderful opportunity for Western molder to enter toy field with fully developed line. Concentration on contract work leads us to offer molds, spray masks, inventory, catalogue sheets etc. on outright sale basis. Reply Box 1834, Modern Plastics.

FOR SALE: 27 molds—new and used—combs, sunglasses frames, X-ray films, action whistle, novelties, toys, sundries, poker chips. Price list available. **RELANCE MOLDED PLASTICS INC.**, Pawtucket, R. I.

TUMBLER MOLDS FOR SALE. One—8 oz. 8 cavity compression tumbler mold. One 9 oz. 9 cavity compression tumbler mold. Easily converted to injection mold—must dispose—sacrifice—write for details. **HARRY DAVIES MOLDING CO.**, 1428 N. Wells St., Chicago 10, Ill.

MOLDS WANTED

WANTED: Molds and or dies for 2 x 2 plastic slide drawers, app. 80 to 100 slides. What can you offer for immediate shipment? Samples appreciated. **CHICAGO PLUSH & LEATHER CASE CO.**, 224 N. Desplaines St., Chicago 6, Ill.

BRUSH MOLDS & BRUSH MACHINERY. Injection molds for ladies, men's, military, nail, toothbrushes, etc. Send particulars & samples. Box 1000, REALSERVICE, 110 W. 34 St., N.Y.C.

PLANTS FOR SALE

WELL EQUIPPED PLASTIC MOLDING PLANT manufacturing plastic wall tile. Consists one Watson-Stillman 12 oz. and related machinery and molds. In operation. A fine small plant—everything relatively new. Lease \$250 month. Good labor market. Complete \$55,000.00 plus any or all raw material and finished products. We must concentrate on other interests. **GULF PLASTICS COMPANY**, 90 N.E. 74 St., Miami, Florida.

FOR SALE

Complete wood flour mill. Capacity 10 tons per 24 hours, using nearby supply of pine and poplar. For further particulars, reply Box 1802, Modern Plastics.

POLYESTER MOLDING EQUIPMENT—Complete plant comprising 2 presses—225 ton, large platen and daylight, 3000 p.s.i. hydraulic auxiliaries, 4 foot preformer with roving gun, etc. Gas-fired preform drying oven with duct work and blowers. Plant now operating. Attractively priced as a package unit. Complete details and specifications upon request. Immediately available. Contact principal, Reply Box 1817, Modern Plastics.

FOR SALE: Complete plastic plant with Extruder, generators, motors, dies, take off arrangements, etc. Complete plant at bargain price of \$8,000.00. Reply to, **PLASCO INCORPORATED**, Jonesboro, Louisiana.

HELP WANTED

CHEMIST OR CHEMICAL ENGINEER

Experienced in manufacture of vinyl floor tile. Excellent opportunity for personal advancement.

Reply Box 1832, Modern Plastics.

PLASTIC CHIEF ENGINEER. Midwest injection molding plant doing Three Million Dollars requires experienced man responsible for estimating mold costs and mold design, production fixtures, customer product development and supervise all engineering functions. Salary commensurate with ability and experience. Unusual opportunity, work with management group. Confidential. Reply Box 1801, Modern Plastics.

DRAFTSMAN—MOLD DESIGNER. Excellent opportunity with growing plastic tooling company. Give full details experience, background and salary. Replies held in strictest confidence. **CACO, INC.**, 1193 W. 2nd St., Pomona, Calif.

CHEMIST, with background in vinyl industry, wanted by chemical company in the New York Metropolitan area for technical sales to vinyl processors. Reply Box 1812, Modern Plastics.

TOOL AND DIE ESTIMATOR. Long established, major die-casting company in suburban metropolitan New York area is expanding—offers excellent opportunity to Experienced Tool and Die Estimator. Die-casting background preferred, plastic considered. Minimum experience 5 to 10 years, age 35 to 40 years. Will relocate qualified man. Write giving experience, salary requirements. Reply Box 1811, Modern Plastics.

PLASTICS SALES MANAGER

Large, well established company wants plastics engineer, chemist or salesman, 5-10 years experience in injection molding, capable of setting up selling organization and technical service group for new injection molding powders. Location Metropolitan New York area. Salary open and commensurate with experience. Our employees have been informed of this advertisement.
Reply Box 1829, Modern Plastics.

PLASTISOL CHEMIST—Unusual opportunity for man experienced in formulating vinyl plastisols with fast growing aggressive Brooklyn concern. **FEDERAL CHEMICALS CORP.**, 210 Wythe Ave., Brooklyn 11, N. Y.

CHEMIST—experienced in all phases of vinyl floor tile compounding. Plant located in Fremont, Ohio. In reply, please give complete resume including age, experience, education and salary desired. Address replies to Personnel Manager, **HEWITT-ROBINS INC.**, Buffalo, New York.

ENGINEER for reinforced plastic experimental and production work. Must have thorough knowledge of polyester-fiberglass laminating techniques. Bag and matched tooling experience particularly desirable. Excellent opportunity in an established firm in a southwestern state. Submit resume of experience and salary requirements. Reply Box 1810, Modern Plastics.

INJECTION MOLDING FOREMAN and Two Assistant Shift Foremen wanted by rapidly expanding injection molder. Must be thoroughly experienced in setting up machine cycles and carrying out machine maintenance. Must have mechanical ability. Knowledge of finishing and painting operations helpful. Salary open. Excellent future for qualified person. Location, Virginia. Reply in confidence to President, Box 1804, Modern Plastics.

MATERIAL AND PROCESS ENGINEER—PLASTICS

M. E. or Chemical Engineering degree with a minimum of two years experience in one or more of the following: Metallic Sandwich (Stress Background); Glass and Optics (Design & Optical Test); Thermoplastics (Transparent Materials-Processing); Sealants (Fuel and Pressure Applications—Test and Development). Applicants should apply to Engineering Personnel Office, **NORTH AMERICAN AVIATION, INC.**, Columbus 16, Ohio.

EXCELLENT OPPORTUNITY open for Chemist experienced in manufacture of Polyvinyl Acetate Emulsions or formulation and manufacture of Synthetic Resin Adhesives. Write fully stating experience, background, etc. Reply Box 1844, Modern Plastics.

RESEARCH CHEMISTS; CHEMICAL ENGINEERS, Mechanical Engineers, Physicists. Progressive Midwest concern, due to its expansion program, has currently available permanent positions for technical graduates with industrial experience. Our employees know of these openings. Your reply, giving personal, educational and work history together with salary expected, will be kept in strict confidence. Reply Box 1840, Modern Plastics.

WANTED: Mold Designer with ability to supervise a mold-design department and be assistant to Chief Engineer in large tool shop. This will be a permanent position for the right man. Reply stating experience and salary requested. Reply Box 1813, Modern Plastics.

WORKS MANAGER for expanding phenolic and formaldehyde resin plant—Excellent Opportunity—Replies strictly confidential. Reply Box 1818, Modern Plastics.

VINYL COLOR MATCHER

Require man experienced in color matching and production color control in vinyl film and sheeting operation.
Reply Box 1831, Modern Plastics.

TECHNICAL ENGINEER WANTED to co-ordinate all chemistry, engineering and process methods involved in production at a medium sized rubber and plastics plant. State salary requirements in letter of application. Reply Box 1825, Modern Plastics.

GENERAL MANAGER WANTED for Plastics Injection Molding Plant. Must have successful experience in the Management of Molded Plastics Production and Sales, Development Engineering, and Technical Service. Full Knowledge required of Piece and Mold Design, Estimating, Production Methods, Cost Analysis, and Equipment. Prefer applicant with additional experience in other plastic fields such as compression molding, extrusion, etc., as further expansion is contemplated. We are looking for a capable and responsible administrator with full plastics experience to take complete charge of our unusually modern and well-equipped custom injection molding plant. For a permanent position, a substantial salary, and a real opportunity, Reply Box 1843, Modern Plastics.

ESTIMATOR — **LARGE AAA-1** midwestern manufacturer of custom molded plastics has vacancy in their Eastern regional office (N.Y.C.) for an estimator with the following qualifications—approximately 5 years of plastic molding, approximately 2 years of plastic molding estimating; knowledge of mold design. Reply Box 1807, Modern Plastics.

SALESMAN WANTED. To sell complete line of urea and phenolic resins, and phenolic molding compounds. All correspondence treated in confidence. Reply Box 1823, Modern Plastics.

DISTRICT MANAGER

TECHNICAL SALESMAN

FOR POLYETHYLENE

Your opportunities are greater with a "Growth Company." Spencer is America's Growing Name in Chemicals. Engineering or technical background required. Experience in processing or sale of thermoplastic resins preferred. District Manager for Midwest Area. Unusual opportunity for young man with judgment and administrative ability. Technical Salesmen for Midwest and East Coast. Chance to start and build your own territory and advance as Spencer grows. Your inquiry will receive immediate attention and will be held strictly confidential. Send full details to:
Director, Product Sales
SPENCER CHEMICAL COMPANY
Dwight Building, Kansas City 6, Missouri

(Continued on page 406)

Modern Plastics

ROHDEN
PLASTIC MOLDED KNOBS
FOR ALL PURPOSES
 RADIO • TV
 AIR CONDITIONING • AUTOMOTIVE

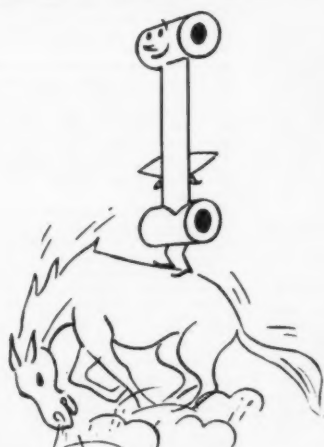


ROHDEN Stock Molds advance with general and specific knob designs for all RTMA applications, as well as electronic controls, air conditioning and ventilating equipment. It will pay you to investigate the ROHDEN line.

Write for Rohden catalog number 54



Designers • Engineers • Plastic Molding
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 Springfield 7-4600
 4739 W. MONTROSE AVENUE, CHICAGO 41, ILLINOIS



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 that absorbs shocks?*

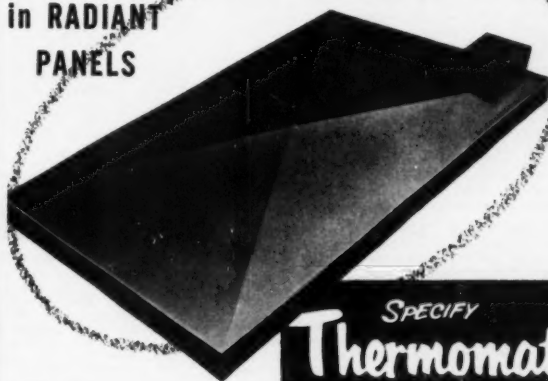
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DuPont ZYTEL

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See pages 10 - 11

for **ABSOLUTE HEAT UNIFORMITY**
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PANELS



SPECIFY
Thermomat

Thermomat Heating Panels provide absolutely controlled surface heat and maintain **UNIFORM HEATING TEMPERATURES** to 700°F.

They have proved ideal for preheating plastic sheets and drying and curing fabrics and coatings.

Our colorful brochure—Yours on request!



THERMOMAT COMPANY, Inc., 300 MAPLE AVE., TRENTON 8, N. J.

Gentlemen: Without obligation, please send us your brochure on Thermomat Radiant Panels for industrial applications.

Name _____
 Firm _____
 Address _____
 City _____ State _____

Thermomat CO., Inc. 300 MAPLE AVENUE, TRENTON 8, N. J.

CLASSIFIED ADVERTISING (Continued from page 404)

PLANT MANAGER—Position with fast growing New England Manufacturer of decorative and industrial laminates. We offer above average pay—job security—pension—career—excellent associates and working conditions. We must have—top level man with degree in industrial, mechanical or chemical engineering—minimum five years experience of executive level in production—age 35 to 50—ability to run and efficiently manage every facet of production. Send Personal Profile—confidential. Reply Box 1839, Modern Plastics.

SALES ENGINEER to represent old-established injection molder. Press capacity 4 to 200 ounces. Tool room, painting, silk screening, hot stamping—all conveyorized. Straightline assembly. Automatic packaging equipment. Prefer experienced men and men with industrial contacts. Also men controlling one or more special deals. Large Midwest plant. Give complete details. Personal interview to follow. Reply Box 1880, Modern Plastics.

VINYL CHEMICAL ENGINEER OR CHEMIST

Experienced on heavy or light gauge calendaring. Real opportunity with progressive company.
Reply Box 1805, Modern Plastics.

PRODUCT ENGINEER desired for position in Development Department of well known company. Applicant must be an engineering graduate, preferably mechanical, and experienced in the field of reinforced plastics. Experience desired includes: production of molded articles by various techniques from fiber and resins, designing of molds and/or preforms to take maximum advantage of raw material characteristics and to produce best design of finished piece, knowledge of product properties, conversion costs, and methods of test. The man selected will be responsible for analytical studies of markets, competitive products, use requirements, test methods, product characteristics, and product specifications. Duties will also involve sales development and field trials. There is ample opportunity for advancement. Salary commensurate with demonstrated ability. Location, Pacific Northwest. Reply Box 1835, Modern Plastics.

SITUATIONS WANTED

DRAFTSMAN

Injection Molds—Drawing experience includes: full information on land areas, semi-positive depth, inserts, frame guide pins, slide guide pins, slide cavity blocks, tongues, sprue tapers, sprue lock pins, runners, gates, ejector pins, water lines, stripper plates, support pillars, ejector return pins—Knowledge of production—Mature, Personable. Adaptable—Position in New York City area preferred.
Reply Box 1836, Modern Plastics.

POLYETHYLENE FILM extrusion; development, production, supervision; 5 years experience, plus previous experience with extrusion of other thermoplastics. Total of 12 years in industry. B.S.C.B.E. degree. Family. Willing to relocate for more responsible position. Reply Box 1828, Modern Plastics.

COMPRESSION MOLDING; over 16 years experience setting-up plants, management, production methods, production planning and control, equipment and mold design, maintenance schedules, personnel training, sales management, design of plastic components and complete assemblies, development and mass production custom and proprietary items. Age—42, married, engineering education. Willing to relocate. Reply Box 1826, Modern Plastics.

REINFORCED PLASTICS ENGINEER. M.I.T. graduate—age 30—6 years experience fabricating reinforced plastics products wants broader opportunity with progressive concern. Has managed all phases of production and development. Experienced in bag-molding, hand layups, Marco process molding, laminating, and press molding. Specialist in developing processing equipment. Reply Box 1815, Modern Plastics.

PRODUCTION SCHEDULING—MATERIAL CONTROL. Injection molding experience. 2 1/4 million records scheduled per month plus other products. Material control, quality control, and purchasing for complete plant. Background—college, 10 years experience production scheduling and material control of electronic plants. Box 1847, Modern Plastics.

PLANT MANAGER—Industrial Engineer: Age 34, with three years experience as Plant Manager, eight years as Industrial Engineer with large Midwest paper & plastic film assembly operations including heat sealing, sewing and packaging plus printing, embossing, coating, sheet cutting and rewinding. Desire management position with emphasis on responsibility, know-how and future. Reply Box 1845, Modern Plastics.

IMAGINEER, PLASTICS, desires non-routine, responsible position where ideas are useful and where polymer background and plastics experience are assets. 2 years in wire and cable: extrusion, formulating, testing, development. 1 1/2 years with injection molder: extrusion-compounding, dryblending, formulating. 2 1/2 years in thermosetting adhesives: resin production, adhesive mixing. B. S. Chemical Engineering, 1948. Graduate work. Reply Box 1838, Modern Plastics.

PLASTIC EXTRUSION ENGINEER: Have developed process for extrusion of rigid vinyl sheet, supervised operation of acetate sheet extrusion unit. Experienced in compounding by extrusion and dry blending. My familiarity with plastic production machinery and with many plastic materials will save you time and money. Will go anywhere where there is an extruder. Reply Box 1830, Modern Plastics.

PLASTIC PIPE—Figuring on establishing a plant or rejuvenating the old? A plant manager—sales manager combination is available. They will extrude perfect pipe for you at low cost. They know how, when and where to market it. Thousands of dollars will be saved by eliminating guesswork. Interested long term arrangement with opportunity to purchase small interest. Reply Box 1841, Modern Plastics.

PRODUCTION SUPERVISOR—Experience in finishing and assembling, injection, compression, molded industrial products and toys. 11 years supervisory experience. Capable of assuming complete charge of production department from initial planning to packaging. Wish to associate with growing progressive manufacturer, North Jersey or New York City. Reply Box 1833, Modern Plastics.

MECHANICAL ENGINEER—5 years injection molding experience, management, production and sales. With thorough knowledge of product design, estimating, mold design, molding, assembly and finishing, and quality and production control. Alert, personable, age 30. Desires responsible position with future. Reply Box 1820, Modern Plastics.

VACUUM FORMING—Practical cost conscious engineering executive. Thoroughly familiar all phases; production, estimating, development and sales from .0075 packages to .125 industrial components. Capable of setting up complete integrated operation including mold making, fabricating, printing, die-cutting, assembly, etc. Can train personnel and develop new techniques and equipment. Well recommended, recognized leader in field. Highly intelligent, personable, adaptable. Will relocate. Reply Box 1846, Modern Plastics.

SALES AGENTS WANTED

SALES REPRESENTATIVE wanted by custom compression and plunger transfer molding company. We are interested only in men of proven ability who are now calling on industrial accounts. Modern plant located in Mid-West with modern and up to date facilities. Desirable territories open—commission basis. Reply giving experience, present lines and territory wanted to Box 1808, Modern Plastics.

EXPANDING, prominent manufacturer of Anti-Static Compounds and Non-Silicon Mold-Lubricant desires additional top-notch SALES REPRESENTATIVES throughout the U. S. & Canada. Every Plastic manufacturer or user, a sales potential. Excellent commissions, assigned territories & finest cooperation. Reply fully and in confidence to Sales Manager, MERIX CHEMICAL CO., 1021 E. 55th St., Chicago 15, Ill.

MANUFACTURER'S REPRESENTATIVE WANTED. Old established New England custom molder of plastic products desires manufacturer's representative familiar with industry and industrial requirements for the New England area. Equipped to handle volume production in compression, transfer and injection molding. Commission basis. Submit complete resume. Reply Box 1814, Modern Plastics.

SALES REPRESENTATIVE wanted by custom compression and plunger transfer molding company. We are interested only in men of proven ability who are now calling on industrial accounts. Modern plant located in Mid-West with modern and up to date facilities. Desirable territories open—commission basis. Reply giving experience, present lines and territory wanted to Box 1822, Modern Plastics.

MANUFACTURERS SALES REPRESENTATIVE wanted for Ohio, Indiana, and West Virginia by a Western Pennsylvania custom and proprietary house; doing compression and transfer molding of thermosetting material, and having catered chiefly to the electronic automobile, T.V., radio, and electric motor trade. Please reply, giving territory you now cover, products you handle, and references. Commission basis. Reply Box 1827, Modern Plastics.

MANUFACTURER'S SALES REPRESENTATIVE. Well connected with industrial and consumer clients, wanted by well known rapidly expanding Eastern Custom Injection Molding and decorating company for N.Y., N.J., Pa., New England on commission basis. Organization assured of top engineering and tooling and excellent cooperation from modern plant equipped for volume molding, assembly, paint spraying, etc. Reply Box MP 1787, EQUITY, 221 W. 41 St., N.Y. 36.

MISCELLANEOUS

CAPITAL FOR DEVELOPMENT of your business. Campaigns for new capital inaugurated and maintained, analysis, advisory, reports, Mergers, Companies reorganized or sold. Underwriting, Stock issues, Bonds, Debentures, Loans, Accounts Receivable, Discounting, Factoring, Insurance and Finance Co. affiliations established. Mortgage Financing of every description. Rediscounging. SY FIELD CONSULTANT, 1008 Fifth Avenue, New York, N.Y. Tel.: BU 8-5792.

MANUFACTURERS AGENT experienced in the sale of resinous compounds wants to add industrial molding and coating compounds to his line (with the exception of paint). Presently selling in Detroit, out-state Michigan, Northern Indiana and Northern Ohio. Has good contacts in the automotive, paper and electrical fields. Reply Box 1806, Modern Plastics.

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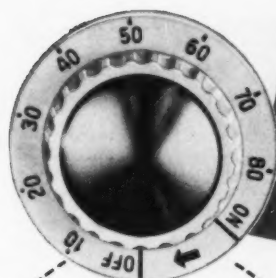
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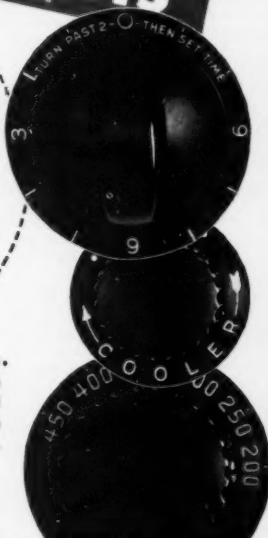
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INDEX OF ADVERTISERS

JUNE 1954

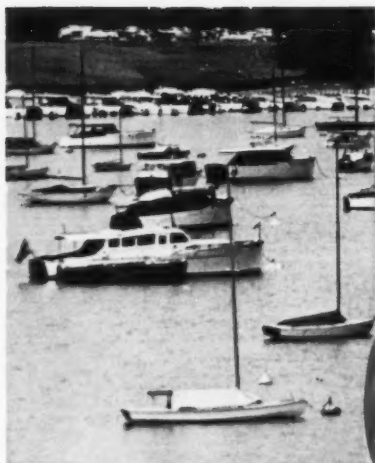
Accurate Molding Corp. 238
 Ace Plastic Company 379, 381
 Acheson Dispersed Pigments Co. 63
 Aerilex Sales Corp., Subsidiary of
 Acryvin Corp. of America 313
 Acromark Company, The 304
 Adamson United Company . 116, 117
 Advance Solvents & Chemical
 Corporation 387
 Aetna-Standard Engineering Co.,
 The 324, 325
 Allied Chemical & Dye Corp.
 Barrett Division 222
 Nitrogen Division 345
 Plaskon, Barrett Division 220, 221
 Semet-Solvay Petrochemical
 Division 227
 American Agile Corporation 367
 American Cyanamid Company
 Pigments Division 309
 Plastics and Resins Division .. 199
 American Molding Powder and
 Chemical Corp. 373
 American Pulverizer Company 249
 American Steel Foundries, Elmes
 Engineering Division ... 186, 187
 Amos Molded Plastics 20
 Anchor Plastics Company, Inc. ... 284
 Anorgana G.M.B.H. 376
 Archer-Daniels-Midland Co. 291
 Argus Chemical Laboratory 77
 Armstrong Products Co. 312
 Athens Tool & Mold Corp. 365
 Atlas Powder Company 403
 Auburn Button Works, Inc. 364
 Automatic Methods Inc. 306
 Avery Adhesive Label Corp. 285
 B.I.P. Engineering Ltd. 108
 Bakelite Company, A Division of
 Union Carbide and Carbon
 Corporation 193-195
 Baldwin-Lima-Hamilton Corp. ... 40
 Ball & Jewell, Inc. 6
 Bamberger, A., Corporation 393
 Barber-Colman Company 270
 Wheelco Instruments Division 340
 Barrett Division, Allied Chemical
 & Dye Corporation 222
 Barzantini International Inc. 379
 Bergen Wire Rope Company 369
 Berkshire Chemicals Inc., Innis,
 Speiden & Co., Inc. Division ... 249
 Bethlehem Steel Company 52
 Bigelow Fiber Glass Products, A
 Division of Bigelow-Sanford
 Carpet Co., Inc. 29
 Binney & Smith Inc. 334
 Bolling, Stewart, & Company, Inc. 300
 Bolta Products, Boltaron
 Division 292, 293
 Boonton Molding Co. 98
 Borden Company, The, Chemical
 Division 112
 Borg-Warner, Marbon Corp. Sub-
 sidiary 74
 Brenner, I. G., Co. 366
 Bridgeport Moulded Products,
 Inc. 48
 Brosites Machine Company Inc. ... 266
 Brown Company 342
 Buttindex Corp. 352
 Cabot, Godfrey L., Inc. 209
 Cadillac Plastic Company 7
 Cady, E. J., & Company 326
 California Reinforced Plastics
 Company Hexcel Products Com-
 pany Division 310
 Cambridge Instrument Co., Inc. ... 276
 Cameron Machine Company 38
 Carbide & Carbon Chemicals
 Company, A Division of Union
 Carbide and Carbon Corp. ... 196

Carborundum Company, The ... 336
 Carpenter Steel Co., The 296
 Carver, Fred S., Inc. 313
 Cary Chemicals Inc. 320
 Catalin Corporation of America ... 1
 Celanese Corporation of America,
 Plastics Division 9
 Chemical Products Corporation ... 332
 Chemold Company 251
 Chemore Corporation 265
 Chicago Molded Products Corp. ... 4
 Ciba Company Inc. 409
 Cincinnati Milling Machine Co.,
 The 315
 Claremont Waste Manufacturing
 Co. 270
 Classified 402, 404, 406
 Clifton Hydraulic Press Co. 331
 Coast Manufacturing & Supply
 Co. 34
 Coating Products 113
 Coe, W. H., Mfg. Co., Inc. 357
 Columbian Carbon Co. 334
 Commercial Plastics and Supply
 Corporation 269
 Commonwealth Plastics Corp. ... 25
 Condux-Werk 76
 Conforming Matrix Corporation ... 58
 Connecticut Plastic Products Co.,
 Inc. 262
 Consolidated Molded Products
 Corporation 30
 Consolidated Vacuum Corpora-
 tion 32
 Continental Can Company, Mills
 Plastic Division 213
 Cosa Corporation 45
 Crompton-Richmond Co., Inc. ... 270
 Crucible Steel Company of
 America 66
 Cumberland Engineering Com-
 pany Inc. 16
 Curbell, Inc. 305
 Dake Engine Company 78
 Daniels, T. H. & J., Ltd. 302
 Davidson-Kennedy Co. 257
 Davis, Joseph, Plastics Co. ... 303, 334
 Davis-Standard Sales Corporation 381
 Deakin, J. Arthur & Son 326
 Decey Products Co. 305
 DeMattia Machine and Tool Co. ... 37
 Detroit Macoid Corporation 377
 Detroit Mold Engineering Co. ... 330
 Diamond Alkali Company ... 44, 412
 Diemolding Corporation 300
 Douglas Aircraft Company, Inc. ... 259
 Dow Chemical Company,
 The 210, 211
 Dowling & Doll Ltd. 237
 Dunning & Boschert Press Co.,
 Inc. 316
 duPont de Nemours, E. I., & Co.
 (Inc.)
 Electrochemicals Department ... 60
 Film Department 115
 Polychemicals Department 10, 11,
 260, 354, 359, 363, 380, 405
 Durez Plastics & Chemicals, Inc.
 Inside Front Cover
 Eagle Tool and Machine Co. 318
 Eastman Chemical Products, Inc. 217
 Eastman Kodak Company, Cellu-
 lose Products Division 247
 Eastman Machine Co. 310
 Egan, Frank W., & Company 102
 Electric Auto-Lite Company, The,
 Instrument and Gauge Division 322
 Elgin National Watch Company ... 313
 Elmes Engineering Division,
 American Steel Foundries 186, 187
 Emery Industries, Inc. 120

Enjay Company, Inc. 219
 Erie Engine & Mfg. Co. 343
 Erie Resistor Corp. 87
 Erinoid Limited 88
 Ever Ready Label Corp. 341
 Fabricon Products, Inc., Plastics
 Division 328
 Farrel-Birmingham Company,
 Inc. 280, 281
 Fellows Gear Shaper Company,
 The 228, 229
 Ferro Chemical Corporation 81
 Ferro Corporation
 Color Division 301, 365
 Fiber Glass Division 348
 Fidelity Machine Company, Inc. ... 61
 Finish Engineering Co., Inc. 95
 Fiore, Wm. M., Inc. 26
 Firestone Plastics Company,
 Chemical Sales Division ... 240, 241
 Fishman Plastics Co. 294
 Fjellman & Winther Company ... 264
 Flexible Products 258
 Food Machinery & Chemical Cor-
 poration, Ohio-Apex Division ... 185
 Foremost Machine Builders, Inc. ... 351
 G.M.C. Process Corp. 362
 Gair, Robert, Company, Inc. 267
 Geissel Mfg. Co., Inc. 276
 General American Transportation
 Corporation
 Parker-Kalon Division ... 272, 273
 Plastics Division 89
 General Dyestuff Corporation ... 53
 General Electric Company
 295, Back Cover
 General Tire & Rubber Company,
 The, Chemical Division 311
 Gering Products, Inc. 79
 Gilman Brothers Company, The ... 299
 Girdler Company, The 245
 Glenn Electric Heater Corporation 375
 Glidden Company, The 59
 Goodrich, B. F., Chemical
 Company 3, 82
 Goodyear Tire & Rubber Com-
 pany, The 14, 15
 Gries Reproducer Corp. 411
 Hale and Kullgren Inc. 324, 325
 Hardesty, W. C., Co., Inc. 370
 Harrington & King Perforating
 Co., The 322
 Harshaw Chemical Co., The 361
 Hartig Engine & Machine Com-
 pany 68
 Harwick Standard Chemical Co. ... 97
 Hendrick Mfg. Corp. 374
 Hercules Powder Company
 Cellulose Products Department ... 39
 Synthetics Department 69
 Hexcel Products Company, A Di-
 vision of California Reinforced
 Plastics Company 310
 Hinde & Dauch 263
 Hobbs Manufacturing Co. 256
 Holland, M., Company 376
 Hommel, O., Co., The 268
 Hooker Electrochemical Company ... 91
 Hurlbut Paper Company 184
 Hyde, A. L. 304
 Hydraulic Press Mfg. Company,
 The 21
 Hydro-Chemie Limited 70
 Ideal Plastics Corporation 55
 Imperial Chemical Industries
 Limited 235
 Improved Machinery Inc. 333
 Industrial Heater Co., Inc. 331
 Industrial Mfg. Corp. 304
 Industrial Research Laboratories 289
 Innis, Speiden & Co., Inc., Div. of
 Berkshire Chemicals Inc. ... 249
 Interchemical Corporation,
 Finishes Division 353
 Jamison Plastics Corp. 354

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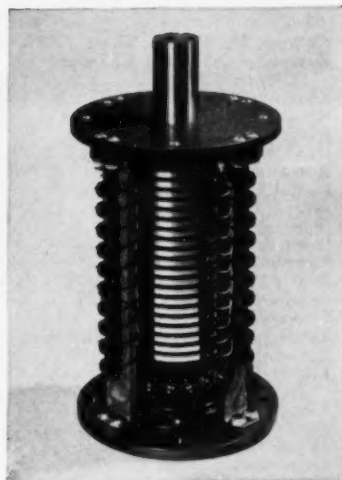
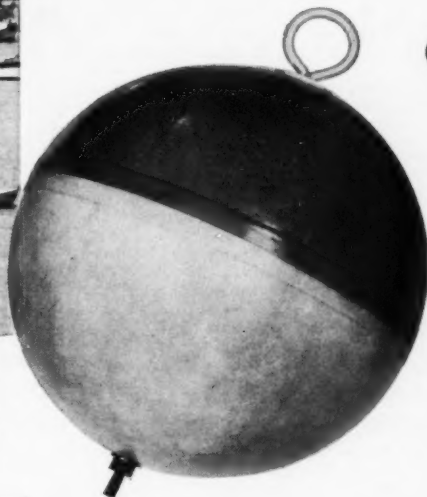


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Name _____

Company _____ Title _____

Address _____

Kellogg, M. W., Co., The . . . 337, 338	Northern Industrial Chemical Co. 268	Servospeed 234
Kentucky Color and Chemical Company, Inc. 376	Norton Laboratories, Inc. 233	Shaw, Francis, & Company Limited 24
Kingsman, E. B., Co., Inc. 302	Ohio-Apex Division, Food Machinery & Chemical Corp. 185	Sheffield Plastics Inc. 271
Kingsley Stamping Machine Co. 366	Olsenmark Corporation 374	Shell Chemical Corporation 317
Klug Engineering Service 368	Omni Products Corporation 71	Shoe Form Co., Inc. 260
Kohnstamm, H., & Co., Inc. 359	Optical Film Engineering Co. 262	Siebert, R. R., Co. 339
Koppers Company, Inc. 56, 57	Owens-Corning Fiberglas Corp. 297	Simplomatic Mfg. Co. 346
Kreidl Chemico-Physical Co., The 397	Owens-Illinois 93	Sinko Mfg. & Tool Co. 278
Kurz-Kasch, Inc. 17	Paddock Tool Company 302	Socony-Vacuum Oil Company, Inc. 244
Lane, J. H., & Co., Inc. 261	Paper Machinery and Research, Inc. 276	South Florida Test Service 341
Latrobe Steel Company 85	Paragon Imprinting Co. 318	Spencer Chemical Company 255
Leaf Plastics Incorporated 274	Parker-Kalon Division, General American Transportation Corporation 272, 273	Standard Machinery Company 381
Lembo Machine Works, Inc. 288	Parker Stamp Works, Inc., The 344	Standard Tool Company 43
Lester-Phoenix, Inc. 96	Pasadena Hydraulics, Inc. 294	Sterling Electric Motors 232
Lewis Welding and Engineering Corporation, The 62	Peerless Roll Leaf Company, Inc. 290	Sterling, Inc. 72
Libbey-Owens-Ford Glass Company, Fiber-Glass Division 73	Peter Partition Corp. 399	Stokes, F. J., Machine Co. 153-156
Liberty Machine Co., Inc. 238	Pittsburgh Coke & Chemical Co. Inside Back Cover	Stokes Molded Products 290
Lind Plastic Products 350	Pittsburgh Plate Glass Company 118	Stricker-Brunhuber Corp. 342
Logan Engineering Co. 83	Selectron Products Division 65	Sturtevant Mill Company 54
Logo, Inc. 257	Plaskon, Barrett Division, Allied Chemical & Dye Corporation 220, 221	Sullivan Varnish Company 379
Lor-El Co. 360	Plastic Glass Corporation 352	Swedlow Plastics Co. 383
Loven Chemical of California 92	Plastic Products Corporation 334	Swift, M., & Sons, Inc. 360
Lucidol Division, Wallace & Tiernan Incorporated 350	Plastics Engineering Company 23	Tell, Jay W., Inc. 368
Machine Factory and Foundry Ltd. 262	Plastiplate Co. Inc. 284	Tenco, Inc. 359
Mallory, P. R., Plastics, Inc. 64	Pluess-Staufner 407	Tennessee Products & Chemical Corporation 104
Manco Products, Inc. 357	Polak's Frutal Works, Inc. 341	Thermo Electric Co., Inc. 332
Manufacturers' Literature 371, 372	Porter, H. K., Company, Inc., The Watson-Stillman Company Division 252, 253	Thermomat Co., Inc. 405
Marblette Corporation, The 202	Preis, H. P., Engraving Machine Co. 363	Thoreson-McCosh, Inc. 282
Marbon Corp., Subsidiary of Borg-Warner 74	Price-Driscoll Corporation 411	Tilp, J. G., Inc. 101
Markem Machine Company 355	Process Mold Co. 316	Timken Roller Bearing Company 103
Marvel Engineering Company 391	Progressive Machine Co., Inc. 312	Tinnerman Products, Inc. 18
Master Machine and Tool Co. 80	Projectile & Engineering Company Limited, The 329	Tracerlab Inc. 90
Matthews, Jas. H., & Co. 310	Pyramid Plastics, Inc. 356	Transilwrap Company 318
Mayflower Electronic Devices Inc. 350	Pyro Plastics Corporation 75	Tri-State Die Casting Corp. 42
Metal & Thermit Corporation 398	Quinn-Berry Corp. 114	Tri-State Plastic Molding Co., Inc. 42
Metallizing Engineering Co., Inc. 107	Radio Corporation of America 316	Tupper Corporation 22
Metaplast Process, Inc. 342	Radio Receptor Company, Inc. 27	Turner Halsey Company 239
Metasap Chemical Company 28	Rainville Company, The 351	Union Carbide and Carbon Corporation, Bakelite Co. 193-195
Michigan Chrome & Chemical Co. 322	Recto Molded Products, Inc. 332	Union Carbide and Carbon Corporation, Carbide and Carbon Chemicals Company 196
Michigan Molded Plastics, Inc. 282	Reed-Prentice Corp. 8, 268	U. S. Industrial Chemicals Co., Division of National Distillers Products Corporation 286, 287
Midland Die & Engraving Co. 188	Reichhold Chemicals, Inc. 231	United States Gasket Company 307
Midwest Plastic Products Co. 363	Reynolds Chemical Products Co. 356	United States Rubber Company (Royalite) 94
Miller Fluid Power Co. 46, 47	Rheem Manufacturing Company 49	Vacumet, Inc. 348
Miller, Frank & Sons 365	Rhode Island Laboratories, Inc. 306	Vacuum Forming Corporation 378
Mills Plastic Division, Continental Can Company 213	Richardson Company, The 84	Van Dorn Iron Works Co., The 243
Minneapolis-Honeywell Regulator Co., Industrial Division 50	Robbins Tool & Dye Company 110	Vin-Rock, Inc. 279
Minnesota Plastics Corporation 349	Rogan Brothers 407	Waldron, John, Corporation 319
Mitts & Merrill 380	Rogers Corporation 36	Wallace & Tiernan Incorporated, Lucidol Division 350
Modern Molders Inc. 347	Rohden Manufacturing Co. 405	Wal-Mar Plastics, Inc. 289
Modern Plastic Machinery Corp. 13	Rohm & Haas Company Plastics Department 19	Waterbury Companies, Inc. 397
Molded Fiberglass Company 354	The Resinous Products Division 99	Watertown Mfg. Co., The 323
Molded Products 214	Romar Plastics, Inc. 366	Watson-Standard Co. 111
Monsanto Chemical Company Organic Chemicals Division 33	Rotherm Engineering Company Inc. 261	Watson-Stillman Company, The Division of H. K. Porter Company, Inc. 252, 253
Plastics Division 385	Rubber and Asbestos Corp. 399	Welding Engineers, Inc. 275
Morningstar Corporation, The 358	Rubber Corporation of America 357	Wellington Sears Company 86
Morton-Withers Chemical Co. 327	Safety Car Heating and Lighting Company, Inc., The 335	West Instrument Corporation 401
Mosinee Paper Mills Company 207	Sarco Company, Inc. 298	Westchester Plastics, Inc. 283
Moslo Machinery Company 100	Schulz, Richard O., Co. 306	Western Felt Works 360
Mt. Hope Machinery Company 381	Schwab & Frank Incorporated 256	Wiegand, Edwin L., Co. 119
Mt. Vernon-Woodberry Mills 239	Schwartz Chemical Co., Inc. 271	Windsor, R. H., Ltd. 105, 321
Muehlstein, H. & Co., Inc. 12	Seranton Plastic Laminating Corp. 400	Witeco Chemical Company 389
Multi Plastics 346	Semet-Solvay Petrochemical Division, Allied Chemical & Dye Corporation 227	Wood, R. D., Company 106
Mycalex Corporation of America 314		Worcester Moulded Plastics Co. 248
Nash, J. M., Company 308		Wrenn Paper Company, The 277
National Distillers Products Corporation, U. S. Industrial Chemicals Co. Division 286, 287		Yardley Plastics Co. 51
National Forge & Ordnance Co. 348		Zenith Plastics Co. 225
National Lead Company 41		
National Research Corporation 407		
National Rubber Machinery Co. 31		
Naugatuck Chemical 205		
Newark Die Company 35		
New Hermes Engraving Machine Corp. 339		
Nitrogen Division, Allied Chemical & Dye Corporation 345		
Nixon Nitration Works 67		

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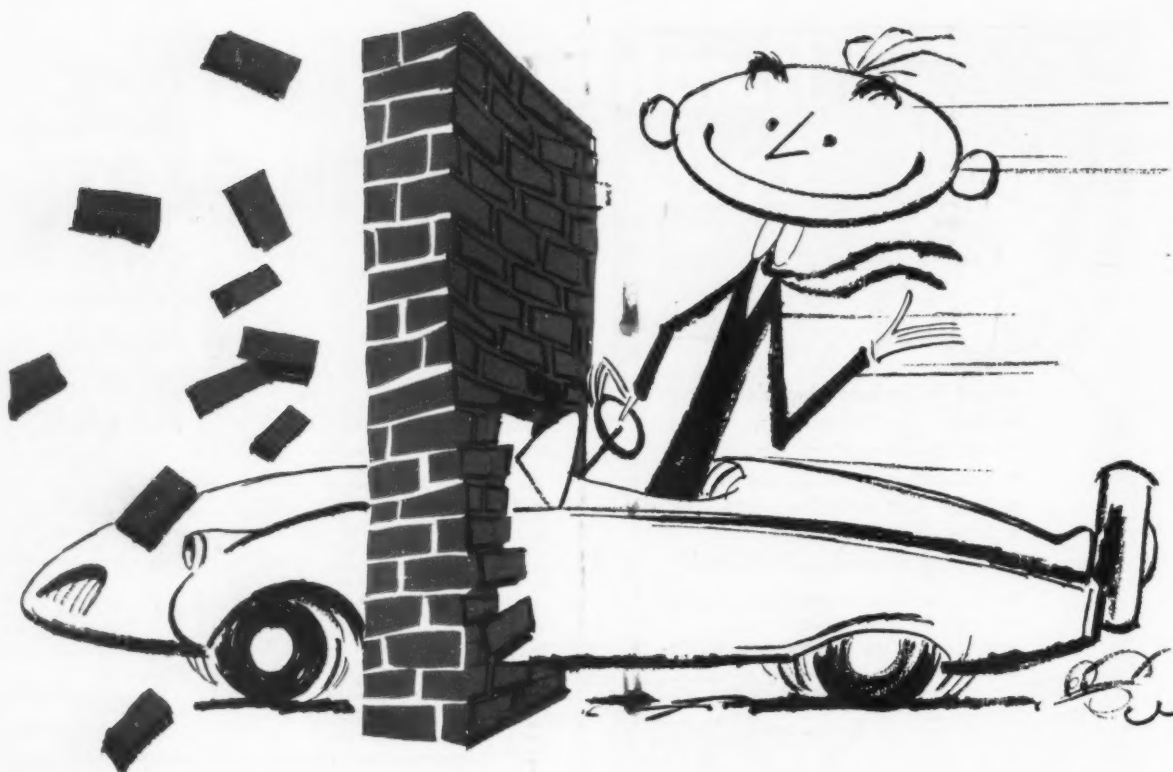
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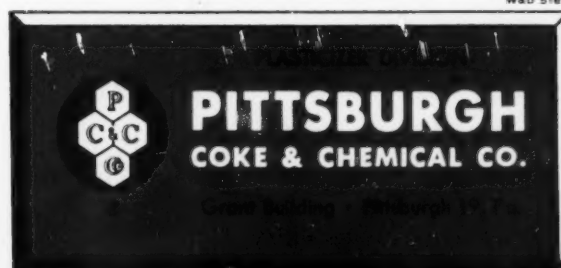
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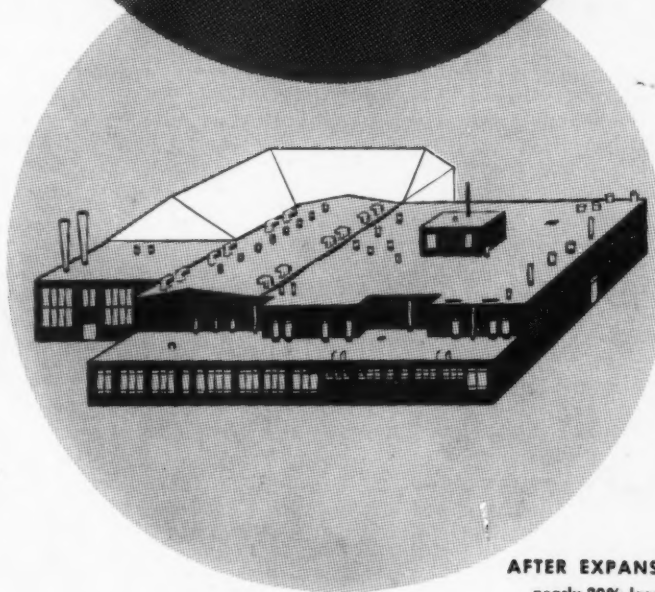
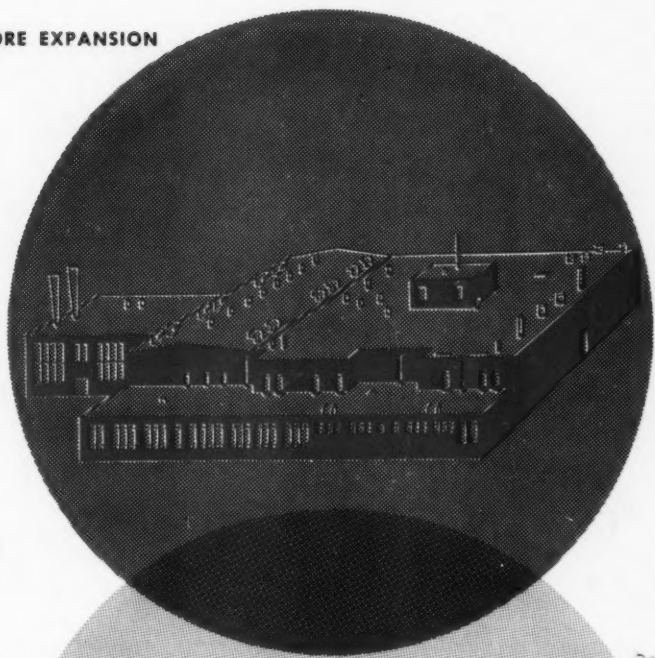
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